

NOV. 20, 1913

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MOTORAGE



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A Word to Automobile Dealers From the Commerce Motor Car Co.

WE believe the time is coming, not far off, when a well organized delivery car department will be recognized by all good dealers as an essential part of their sales organization.

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The country is sold on motor delivery, and if gear driven commercial cars made from pleasure car chassis had actually given service, the use of motor car delivery would today be almost universal.

The car we have to sell, the Commerce Delivery Car, has the unique distinction of giving satisfaction wherever it is used.

It is a 1000 pound delivery wagon selling for \$975.00.

It is manufactured to be a commercial car by a company manufacturing nothing but commercial cars.

It is built for delivery work—for business—for hard, every-day, exacting service and for nothing else.

It uses friction drive with the result that it has ample power and is absolutely fool proof.

(Remember that every car with cone or multiple disc clutch depends finally upon friction for its driving power and that the Commerce friction drive means no clutch to slip and no gears to strip. It is fool proof.)

The remarkable service that the Commerce car has given under all working conditions is more than sufficient indication—it is positive proof—that the Commerce car is designed and built right.

We have been building Commerce cars for two years. There are more than 500 Commerce cars in operation. We have watched the performance and have the record of every one.

Today we know that the Commerce car is the simplest, surest, most economical and most efficient delivery car on the market. It has no competition.

No one can question the extent of the market ahead of such a car.

The fact is that the market for a good delivery car—The Commerce Car—is wider than the country itself.

The question of how to sell delivery cars is one with a very simple answer.

Delivery cars cannot be successfully sold as a side line by pleasure car salesmen who try to sell both types of cars.

But the simple, concentrated effort of one or two good salesmen, the demonstrator continually in use, means the start of a Commercial Car department which will prove the most valuable asset of any automobile agency.

The Commerce Car supplies a demand that is active practically every month of the year. And where a car stands up—as the Commerce always does—each sale is an asset, and not an obligation demanding extravagant service and maintenance.

We have proved this car—we know it is a delivery car whose market and success are assured.

We are pinning our faith to that knowledge. We are entering on a period of expansion.

We want dealers—active, interested, progressive dealers who are prepared to seek business along the right lines.

We want business men who are prepared to sell Commerce Cars as actively and determinedly and conscientiously as we build them. We stand back of the Commerce Car and, in the same way, we will stand back of the right sort of dealers.

The Commerce Car plus a dealer's persistence and application means profits.

If this has interested you—write to us now—better still, come to Detroit and see the Commerce Car plant and the ideals and plans and character and position and spirit of the men who are making Commerce Cars.

The Commerce Motor Car Company Administration Dept., 624-630 Penobscot Bldg., Detroit, Mich.

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1000 pound capacity, 25% overload, guaranteed.
Equipment, including electric horn, complete.
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34 x 2½ Goodyear Motz truck tire.
Express, full panel, or canopy top.

Clear floor space—64 inches long;
42 inches wide;
52½ inches high.
Gear ratio—6 to 1 on high;
20 to 1 on low.
Friction drive. Wheel base—102 inches.

The New Moline-Knight will have Truffault-Hartford Shock Absorbers

Coincident with their determination to build a car embodying the latest type of the famous Knight power plant, the Moline Automobile Company determined that this car, to be known as the "Moline-Knight," should figure as one of the easiest riding cars on the market.

With this object in view tests were made by the Moline engineers of various types of springs and shock absorber equipment. In the final analysis it was established that Truffault-Hartford Shock Absorbers, used in conjunction with highly flexible springs, furnished the ideal suspension, a combination for comfort that would be hard to excel.

As President of the Moline organization and an engineer of high standing, W. H. Van Dervoort has always been a warm advocate of Truffault-Hartford Shock Absorbers. And in the great victories scored by the Dreadnought Moline in the Glidden Tours and Chicago Automobile Club races, Truffault-Hartfords have taken a prominent part.

Hundreds of motor car owners have looked forward to the possession of a car with the wonderful "Knight" motor just as the woman cherishes the thought of sometime having a Tiffany necklace of her own.

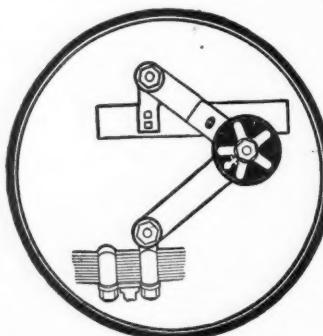
With the announcement of the Moline-Knight for \$2400 their hopes have been realized. The advent of such a car for such a

price, including as it does the famous Knight sleeve valve motor, renowned for its great speed and matchless silence, would seem little less than phenomenal if it were not for the Moline Company's well known factory facilities for economical production.

In furnishing Truffault-Hartford Shock Absorbers as standard equipment, the Moline Company becomes the twenty-sixth addition to the long list of leading manufacturers whose entire output is Truffault-Hartford equipped. Dealers appreciate the importance of this device in selling the "comfort idea." The complete elimination of jolt, jar and vibration, which Truffault-Hartfords most effectively accomplish, reduces the wear on the tires and increases the endurance of every car part.

It is fast getting to the point where the car builder who does not equip with the

**New Automatic
Truffault-Hartford
SHOCK ABSORBER**
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will be an exception. Meantime car buyers will find it much to their advantage to insist upon Truffault-Hartfords on the car they buy. Five models, the New Automatic \$60 per set of four; other models, \$50, \$40, \$25 and \$15. Send for Catalog.

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Arboco is the new Automobile Electric Headlight created in “All-Glass” for 1914. This is its first appearance. It is the very newest thing in Motor-dom. First came the oil lamp—then, the gas lamp—next, the metal electric lamp—and now, Arboco.

Motorists of critical preferences—whose purses open only to purchase the best—who demand the ultimate in durability, style and beauty—welcome the advent of the Arboco. Because it is the lamp of obvious distinction. Because it is the only lamp really possessing advanced features. Because it is the only lamp made with “color-trim” to suit the individual preferences of each purchaser. The “color-trim” of the Arboco can be made to exactly match any metal or any color or tint—or any combination of these required by the trim of the car—or that may be desired by the most fastidious purchaser.

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The “color-trim” of the Arboco is underneath the glass—two coats, baked. This gives it the beautiful “deep” effect of Japanese lacquer. Being underneath it can never become scratched or marred—cannot becloud, tarnish or dull. It will retain its original color and lustre forever. It has a true parabolic reflector coated with 99 per cent pure silver finish “baked on” by the Arboco (secret) process.

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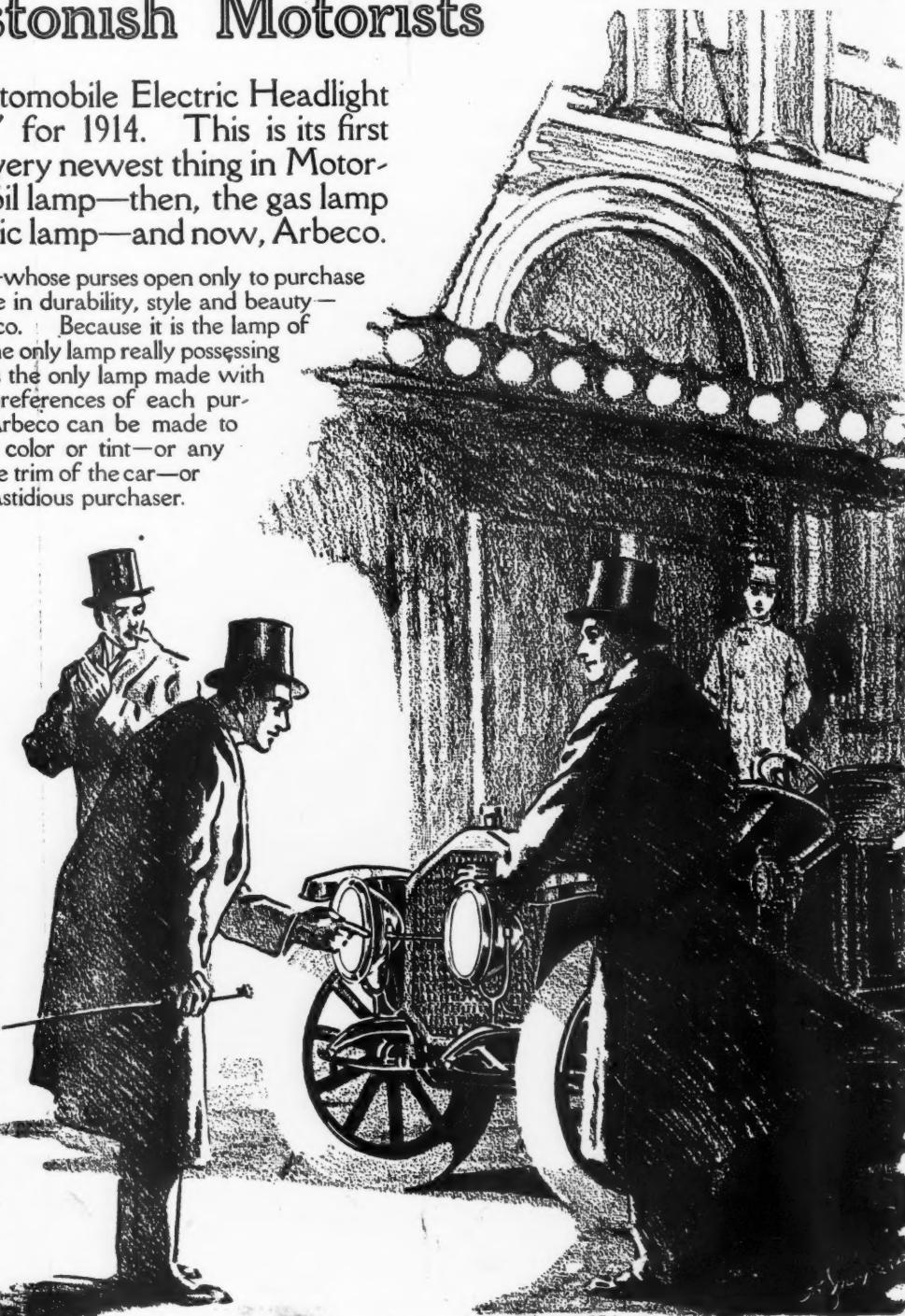
The Arboco lamp is creating unusual attention wherever shown. It is not possible to produce a more durable lamp, or one possessing more style or beauty. If you are critical of taste—if you would possess the latest, write us for special descriptive circular.

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The monogram or crest of purchaser will be “inlaid” with the “color-trim” of the Arboco when so ordered. This is a desirable “style feature” for motorists who want something “different”.



Arboco at the Chicago Athletic Assn.

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MOTOR AGE

MotorAge's Review of - 1913 - Road Racing



Earl Cooper of California Captures Driving Championship While Car With Best Record Is the Stutz, Which Makes Remarkable Record by Winning Seven Consecutive Firsts

By C. G. Sinsabaugh

CALIFORNIA, the Golden State, has produced one more champion—Earl Cooper of Los Angeles, to whom Motor Age hands the speed crown and declares him to be without a peer as a road race driver for the season of 1913 by virtue of his five firsts and one second in six starts—a record never before equalled in the world's road racing history.

Cooper drove a Stutz in this campaign and naturally, therefore, the companion title—that of champion car of the year—belongs to the Hoosier concern manufacturing the "car that made good in a day." A record fully in keeping with that of Cooper's belongs to the Stutz, which started fifteen times, winning seven firsts, three seconds and one third, and being unplaced only four times. It is all the more remarkable that the seven firsts were consecutive victories, a record never before achieved by any make of car in the history of the world's road racing.

This brief summary of the past season in road

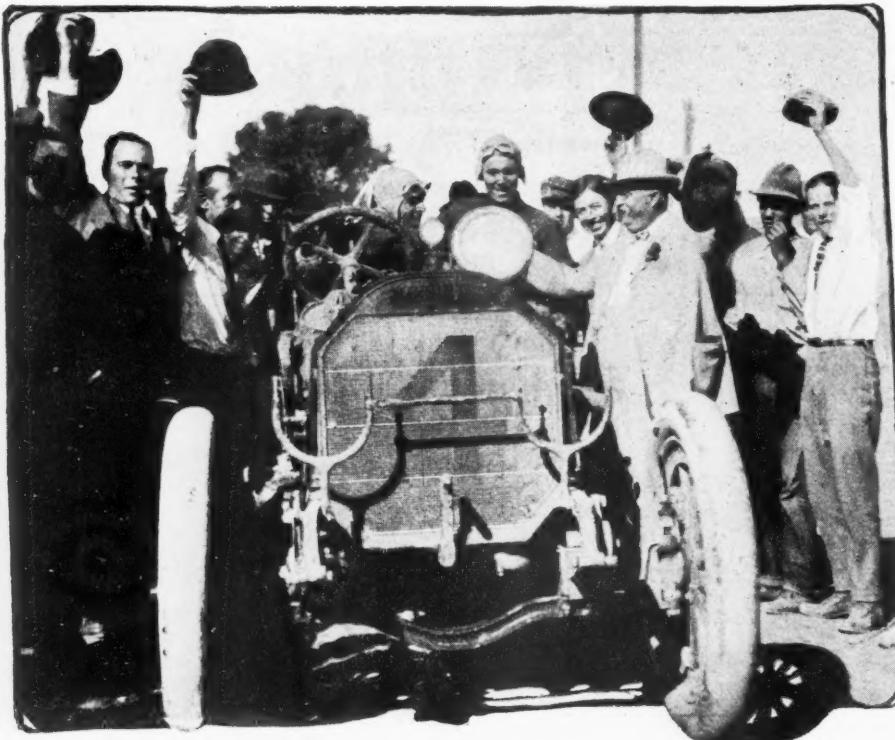
racing is compiled by Motor Age in accordance with the custom inaugurated 5 years ago and which always has been recognized as official in deciding which driver and car made the best showing. That these pickings have been most accurate is borne out by the reputations achieved by both cars and drivers selected. In 1909 Bert Dingley and the Chalmers were the champions, the former with a record of two firsts, three seconds and a third out of seven starts, and the latter with five firsts, three seconds and two thirds out of twenty-two starts. Ralph Mulford and the Lozier were champions of 1910, Mulford winning two firsts and one second out of five starts and the Lozier taking four firsts and one second out of eight starts.

The National made its phenomenal record in 1911 with nine firsts, three seconds and two thirds out of twenty-one starts, while Harvey Herrick, one of the National drivers, was the individual star with three firsts out of four starts. Ralph



RECORD OF CHAMPION CARS AND DRIVERS FROM 1909—1913

| CHAMPION CAR EACH YEAR | | | | | | |
|---------------------------|----------------|---------|-------|--------|-------|----------|
| Year | Make of Car | Started | First | Second | Third | Unplaced |
| 1909 | Chalmers | 22 | 5 | 3 | 2 | 12 |
| 1910 | Lozier | 8 | 4 | 1 | 0 | 3 |
| 1911 | National | 21 | 9 | 3 | 2 | 7 |
| 1912 | Fiat | 12 | 4 | 1 | 0 | 7 |
| 1913 | Stutz | 15 | 7 | 3 | 1 | 4 |
| CHAMPION DRIVER EACH YEAR | | | | | | |
| Year | Driver | Started | First | Second | Third | Unplaced |
| 1909 | Bert Dingley | 7 | 2 | 3 | 1 | 1 |
| 1910 | Ralph Mulford | 5 | 2 | 1 | 0 | 2 |
| 1911 | Harvey Herrick | 4 | 3 | 0 | 0 | 1 |
| 1912 | Ralph de Palma | 5 | 4 | 0 | 0 | 1 |
| 1913 | Earl Cooper | 6 | 5 | 1 | 0 | 0 |



OLIN DAVIS IN LOCOMOBILE, WINNER OF LOS ANGELES-PHOENIX RACE

DePalma won the individual championship last year with four firsts out of five starts,

but his Mercedes was not the champion car, that honor going to the Fiat with four firsts and one second out of twelve starts.

Thus it will be seen that the Pacific coast has been a prolific producer of champions, for Dingley, Herrick and Cooper all hail from the land of the setting sun, although California cannot claim the present champion as a native son, because Cooper was born in Nebraska, moving to California at an early age.

1913 a Poor Year

Looking back over the records of the past five seasons, it must be confessed that 1913 is the poorest of the lot from a promoter's viewpoint, because there were fewer road races this year than in any other season since 1909. The count shows but sixteen, as compared with twenty in 1912, twenty-seven in 1911, twenty-one in 1910, and twenty-seven in 1909. This can be explained easily, however. In the first place, Savannah's attack of cold feet prevented the running of three classics—the Vanderbilt, grand prix and Savannah light-car race. Then, again, where the Chicago Automobile Club ran five races in 1912, this year it was satisfied to stage

two at Elgin. The same story is heard from Santa Monica, where the card was cut from three races to one.

On the other hand, we had some new faces this year. Corona, with its magnificent 3-mile circuit, almost a speedway, cut in with three races, which help

EARL COOPER'S RECORD

1902—First in San Jose race.
 1905—First in Seattle meet.
 1908—First in three races of 2-day meet at Tanforan.
 1909—Second Portola road race, October. Won three track races, October.
 1910—Lost 50-mile race at Oakland, Decoration day.
 1910—Tied Harris Hanshue in Nineteenth street hill-climb in San Francisco.
 1910—Won three of five races in Oakland motordrome.
 1911—Won every race in San Jose Labor day meet.
 1911—First in class race in second free-for-all at San Jose, December.
 1912—First both class road and free-for-all at San Jose St. Patrick's day.
 1912—Broke Folsom-Sacramento record, May.
 1912—Broke Sacramento-Stockton record, May.
 1912—Won five of six races in 2-days' meet at Sacramento, June 1-2.
 1912—Won class race at Tacoma, July 5.
 1912—Lost race at Tacoma, July 6.
 1912—First in both 10 and 25-mile race at Fresno, October 5.
 1912—Finished fourth in Santa Monica.
 1912—Defeated Oldfield at San Jose, November 13.
 1912—Defeated Oldfield at Tanforan, November 16.
 1912—Won three of four from Burman at Los Angeles, December 8-9.
 1913—Broke 200-mile record at Fresno, February 10.
 1913—Second in San Diego road race, March 1.
 1913—Drove relief in Indianapolis, Decoration day.
 1913—Won Golden Potlach at Tacoma, July 5.
 1913—Won Montamarathon at Tacoma, July 7.
 1913—Won Santa Monica road race, August 9.
 1913—First in Corona 450 class, September 9.
 1913—First in Corona free-for-all, September 9.
 1913—First in 100-mile free-for-all at Bakersfield, September 28.
 1913—First in both 15 and 25-mile race at Fresno, October 4.



GIL ANDERSON, WHO WON ELGIN NATIONAL TROPHY IN A STUTZ

RECORD OF CARS

| Name of Car | Start | First | Second | Third | Unplaced |
|--|-------|-------|--------|-------|----------|
| Benz | 6 | 1 | 0 | 0 | 5 |
| Buick | 20 | 2 | 2 | 3 | 13 |
| Delta | 1 | 0 | 1 | 0 | 0 |
| Fiat | 11 | 2 | 2 | 1 | 6 |
| Ford | 8 | 0 | 1 | 0 | 7 |
| Hudson | 2 | 0 | 0 | 1 | 11 |
| Keeton | 2 | 0 | 1 | 0 | 11 |
| Locomobile | 2 | 1 | 0 | 0 | 2 |
| Marmon | 3 | 0 | 2 | 0 | 0 |
| Mercer | 15 | 1 | 2 | 2 | 10 |
| Overland | 3 | 1 | 0 | 0 | 0 |
| Reo | 2 | 0 | 1 | 0 | 1 |
| Simplex | 7 | 1 | 0 | 0 | 6 |
| Studebaker | 6 | 0 | 0 | 1 | 0 |
| Stutz | 16 | 7 | 3 | 1 | 5 |
| Tulsa | 2 | 0 | 0 | 1 | 1 |
| Velle | 3 | 0 | 0 | 2 | 1 |
| Unplaced: Alco, 1; Apperson, 7; Blue Midget, 1; Brena, 1; Chalmers, 2; Cadillac, 8; Case, 1; Cole, 1; Columbia, 1; Endicott, 1; Erwin, 1; Hupmobile, 1; Inter-State, 1; Isotta, 1; Kissel, 1; Macomber, 2; Marion, 1; Mason, 6; Maxwell, 2; Mercedes, 1; Mitchell, 3; Moon, 1; National, 7; Nyberg, 2; Packard, 1; Pope-Hartford, 1; Romana, 1; Speedwell, 1; Thomas, 2. | | | | | |

swell the count, while San Diego, with three more, also was a newcomer. Then, too, we had more of the straightaway contests than ever before, as exemplified by the two desert events which finished at Phoenix, the one from Los Angeles to Sacramento, and Albuquerque-Santa Fe.

RECORDS OF THE DRIVERS

| Name of Driver | Starts | First | Second | Third | Unplaced |
|----------------|--------|-------|--------|-------|----------|
| Gil Anderson | 1 | 1 | 0 | 0 | 0 |
| Ball | 1 | 0 | 1 | 0 | 0 |
| Burman | 4 | 0 | 1 | 0 | 3 |
| Caldwell | 3 | 0 | 1 | 1 | 0 |
| Cameron | 1 | 0 | 1 | 0 | 0 |
| Campbell | 2 | 1 | 0 | 1 | 0 |
| Carlson | 3 | 1 | 0 | 1 | 1 |
| Chandler | 1 | 0 | 0 | 1 | 0 |
| Earl Cooper | 6 | 5 | 1 | 0 | 0 |
| O. Davis | 1 | 1 | 0 | 0 | 0 |
| Dawson | 2 | 0 | 1 | 0 | 1 |
| De Palma | 3 | 1 | 0 | 0 | 2 |
| Emblem | 1 | 0 | 1 | 0 | 0 |
| Harrison | 2 | 0 | 0 | 0 | 1 |
| Hill | 1 | 1 | 0 | 0 | 1 |
| Hughes | 2 | 0 | 0 | 1 | 1 |
| John Johnson | 1 | 0 | 1 | 0 | 0 |
| Lewis | 2 | 0 | 1 | 0 | 1 |
| Mulford | 2 | 0 | 1 | 0 | 1 |
| Newkirk | 1 | 1 | 0 | 0 | 0 |
| Naquin | 1 | 0 | 0 | 1 | 0 |
| L. Nikrent | 4 | 0 | 0 | 2 | 2 |
| Oldfield | 4 | 0 | 1 | 1 | 2 |
| Parsons | 1 | 1 | 0 | 0 | 0 |
| Smith | 1 | 0 | 1 | 0 | 0 |
| Sperry | 1 | 1 | 0 | 0 | 0 |
| Verbeck | 3 | 1 | 1 | 0 | 1 |
| Waterman | 1 | 1 | 0 | 0 | 0 |
| Wishart | 3 | 0 | 0 | 1 | 2 |

Unplaced: Alexander, 1; Aguilar, 1; Ballard, 1; Buxton, 1; Brenna, 1; Barcroft, 1; Beaudet, 2; Bergdolt, 1; Briscoe, 1; Corbet, 1; Creech, 1; Conant, 1; Crawford, 1; Endicott, 4; Faulkner, 1; Fleming, 1; Good, 1; Greer, 1; Grant, 1; Hanshue, 1; Haupt, 1; Hagerman, 1; Henning, 1; Hesch, 1; Jarrett, 1; Jeannette, 4; Kern, 1; Knox, 1; Lambis, 1; Latta, 1; Leach, 1; Leybold, 1; Luttrell, 1; Magonne, 1; Mansfield, 1; McKelvey, 1; Miller, 1; Morris, 2; Nichols, 1; Ohsahl, 1; Owen, 1; Pratt, 1; Rhodes, 1; Rickenbacher, 2; Rice, 1; Shank, 2; Siefert, 2; Soules, 2; Tetzlaff, 3; Toft, 1; Trove, 1; Welch, 2; Wilson, 1; Stanley, 1.

A study of the charts shows that racing suffered in other departments than in numbers. The distances were shorter, as a rule, averaging only 207 miles for the

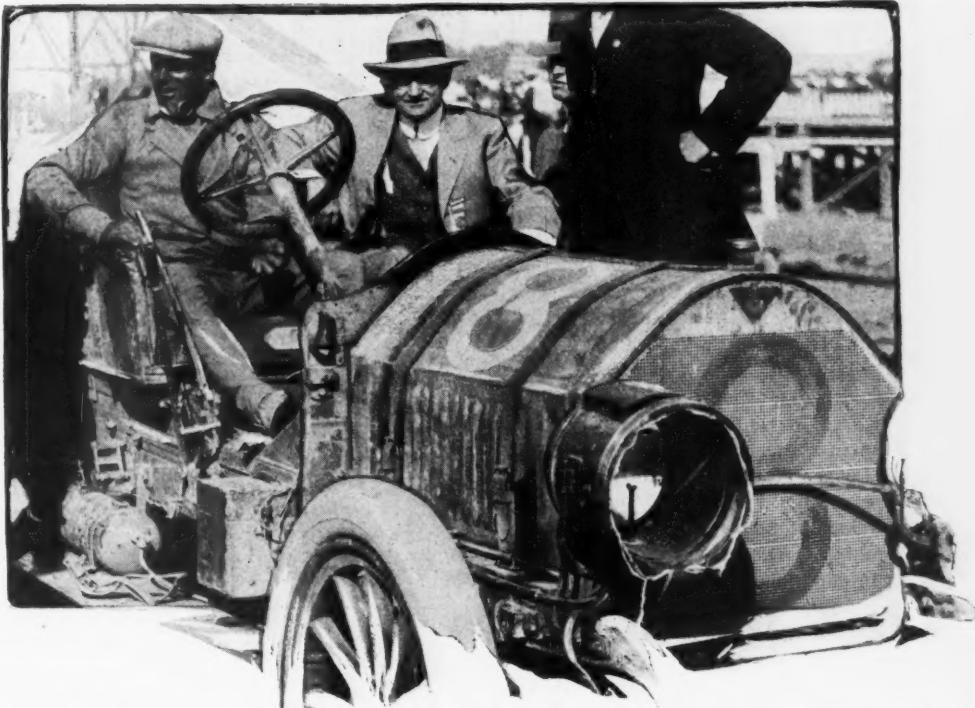
STATISTICS OF 1909-1910-1911-1912-1913

COMPARISON OF THE LAST 5 YEARS OF ROAD RACING

| | 1913 | 1912 | 1911 | 1910 | 1909 |
|---|--------|-------|-------|-------|-------|
| Number of road races..... | 16 | 20 | 27 | 21 | 27 |
| Number of miles..... | 3,321 | 4,645 | 5,591 | 4,449 | 5,100 |
| Average distance of each race..... | 207 | 232 | 206 | 211 | 211 |
| Average miles per hour each winner..... | 57.76 | 60.25 | 63.22 | 53.8 | 49.2 |
| Average each car that finished..... | 54.68 | 54.49 | 59.51 | 51.58 | 50.62 |
| Fastest road race..... | 75.03 | 78.7 | 74.62 | 73.22 | 69.6 |
| Slowest road race..... | 29.94 | 23.7 | 27.03 | 26.41 | 24.8 |
| Number of starters..... | 83 | 156 | 202 | 206 | 223 |
| Average number of starters..... | 5 3-16 | 7 1/2 | 7 1/2 | 9 1/2 | 8 1/2 |
| Number of cars allowed to finish..... | 44 | 71 | 92 | 82 | 94 |
| Percentage of finishers..... | 53.01 | 45.5 | 44.8 | 39.7 | 42 |
| Number of makes competing..... | 46 | 44 | 44 | 55 | 63 |

Fastest Races Each Year

| Year | Race | Distance | M.P.H. | Driver and Car |
|------|------------------|----------|--------|-------------------|
| 1909 | Riverhead, L. I. | 113.7 | 69.6 | Chevrolet, Buick |
| 1910 | Santa Monica | 115 | 73.22 | Tetzlaff, Lozier |
| 1911 | Santa Monica | 202 | 74.62 | Herrick, National |
| 1912 | Santa Monica | 303 | 78.7 | Tetzlaff, Flat |
| 1913 | Corona | 251 | 75.03 | Cooper, Stutz |



JED NEWKIRK, WHO WON EL PASO-PHOENIX RACE IN SIMPLEX



CARLSON, WHO WON SAN DIEGO RACE IN A BENZ

sixteen races, as against 232 for twenty races last year. The average number of starters also was smaller, for where the 1912 events averaged nearly eight cars to a race, this year the count was under six. The general speed, too, was poorer by a considerable margin. Whereas, the winners of 1912 earned their laurels by virtue of a mile-a-minute pace, this year the average dropped to 57.76 m. p. h. this year.

More Makes Represented

There were more makes of cars competing, however, than in any previous year since 1910—forty-six—which is explained largely by the desert races, which attracted many private owners, who saw a chance to win big money in these long scrambles. There were fewer manufacturers supporting racing teams than ever before, the brunt of this support falling on the Mercer and Stutz, with the Keeton chipping in through Bob Burman.

For the first time since 1909 the road record failed to go up. In 1909 the fastest race of the year was won at the rate of 69.6 m. p. h. by Louis Chevrolet in a Buick at Riverhead, L. I. The following

STARTING AND FINISHING

| Race | Distance | Starters | Finishers |
|------------------------|----------|----------|-----------|
| Elgin National | 301.68 | 12 | 12 |
| Santa Monica | 445.2 | 14 | 14 |
| C. A. C. trophy, Elgin | 301.68 | 10 | 10 |
| Corona free-for-all | 301.81 | 9 | 3 |
| Corona medium-car | 251.97 | 6 | 6 |
| Corona light-car | 102.45 | 10 | 10 |
| Potlatch, Tacoma | 200 | 7 | 2 |
| Inter-City, Tacoma | 102.2 | 8 | 4 |
| Montamarathon | 250 | 10 | 4 |
| San Diego, January | 190 | 14 | 4 |
| San Diego free-for-all | 200 | 6 | 3 |
| San Diego, 231-300 | 100 | 4 | 3 |
| Los Angeles-Sacramento | 443.6 | 50 | 18 |
| Los Angeles-Phoenix | 564 | 25 | 7 |
| El Paso-Phoenix | 517 | 19 | 8 |
| Albuquerque-Santa Fe | 130 | 9 | 3 |

AVERAGE MADE BY EACH CAR FINISHING IN SIXTEEN AMERICAN ROAD RACES IN 1913

| M.P.H. Dist. | Car | Driver | Road Race | M.P.H. Dist. | Car | Driver | Road Race | |
|--------------|--------|------------|-----------|--------------------------|-------|--------|------------|-----------|
| 75.03 | 251.97 | Stutz | Cooper | Corona, medium car | 47.69 | 190 | Flat | San Diego |
| 74.63 | 301.81 | Stutz | Cooper | Corona, free-for-all | 45.89 | 190 | Merger | San Diego |
| 73.77 | 445.2 | Stutz | Cooper | Santa Monica | 44.53 | 190 | Stutz | Carlson |
| 72.63 | 445.2 | Mercer | Oldfield | Santa Monica | 41.40 | 102.2 | Buick | Leybold |
| 72.33 | 301.81 | Fiat | Verbeck | Corona, free-for-all | 39.58 | 190 | Buick | Nikrent |
| 71.5 | 301.68 | Stutz | Anderson | Elgin national | 39.39 | 443.6 | Flat | Verbeck |
| 71.07 | 200 | Stutz | Cooper | Potlatch, Tacoma | 38.18 | 443.6 | Buick | Waterman |
| 69.76 | 250 | Fiat | Cooper | Montamarathon | 38.09 | 443.6 | Flat | Oldfield |
| 70.71 | 250 | Stutz | Lewis | Montamarathon | 37.91 | 443.6 | Flat | Soules |
| 69.7 | 301.68 | Mason | Mulford | Montamarathon | 30.1 | 130 | Overland | Sperry |
| 68.91 | 445.2 | Mercer | Nikrent | Santa Monica | 30.11 | 517 | Simplex | Newkirk |
| 68.28 | 250 | Tulsa | Hughes | Montamarathon | 29.94 | 564 | Locomobile | Davis |
| 67.5 | 301.68 | Mercer | Wlshart | Elgin national | 27.72 | 517 | Stutz | Johnson |
| 66.8 | 301.68 | Mercer | dePalma | C. A. C. cup, Elgin | 26.81 | 517 | Velle | Naquin |
| 65.93 | 102.2 | Stutz | Parsons | Tacoma, inter-city | 26.75 | 564 | Marmon | Ball |
| 65.2 | 301.68 | Delta | Dawson | C. A. C. cup, Elgin | 26.70 | 517 | Mitchell | Miller |
| 64.3 | 301.68 | Grant | Isotta | Elgin national | 26.63 | 517 | Brena | Clark |
| 63.87 | 102.2 | Stutz | Cameron | Tacoma, inter-city | 26.01 | 564 | Buick | Nikrent |
| 63.3 | 301.68 | Mercer | dePalma | Elgin national | 25.50 | 517 | Cadillac | Corbet |
| 63.15 | 200 | Keeton | Burman | Potlatch, Tacoma | 24.86 | 517 | Cadillac | Hagerman |
| 63.15 | 102.45 | Buick | Waterman | Corona, light car | 24.62 | 564 | Simplex | Rice |
| 60.8 | 102.45 | Reo | Jackson | Corona, light car | 24.32 | 564 | Mercer | Buxton |
| 60.59 | 251.97 | Marmon | Caldwell | Corona, medium car | 23.72 | 564 | Mitchell | Greer |
| 59.11 | 200 | Benz | Carlson | San Diego, free-for-all | 23.66 | 130 | Velle | Caldwell |
| 55.24 | 102.2 | Hudson | Hanson | Tacoma, inter-city | 23.42 | 130 | Buick | Emblem |
| 52.9 | 102.45 | Studebaker | Goode | Corona, light car | 23.33 | 564 | Buick | Ellis |
| 51.02 | 100 | Buick | Campbell | San Diego, 231-300 class | 23.28 | 517 | Buick | Creech |

season Tetzlaff jumped it to 73.22 with his Lozier at Santa Monica, while on the same course in 1911 Herrick, in the National, traveled at the rate of 74.62. Santa Monica in 1912 saw the smashing of the world's road racing record when Tetzlaff, in a Fiat, went 303 miles at 78.7 m. p. h. The past season failed to dislodge Tetzlaff, but this is not to be expected, for the Stutz car driven by Cooper has a comparatively small motor, whereas Tetzlaff's mount was one of those huge Fiats built for free-for-all racing. Under the circumstances we should say that 75.03 m. p. h. of Cooper at Corona is fully as creditable a performance as that of Tetzlaff the year previous at Santa Monica.

Looking Back 5 Years

It might not be out of place right here to review briefly the results of the five years of racing kept track of by Motor Age. In that time there have been 111 road races run in this country at a total distance of 23,096 miles, making the average of each race 208 miles. These 111 winners averaged 56.84 m. p. h., quite a record in itself, and when one remembers that in 1909 the average of the winners of that year only was 50.52 m. p. h. In these 111 road races there have been 870 starters, of which number 383 have been given the checkered flag.

It is evident from the results that we are going to have more racing of the character of the events so popular on the Pacific coast, because of the success attending the running of the Los Angeles-Sacramento race and the two desert events. When the interest is keen enough to bring out a field of fifty starters in such a long grind as the one from Los Angeles to the state capital of California, it surely must mean that this is a kind of sport that takes with the public. On the other hand, it is not to be denied that road racing on established courses, like the ones at Elgin, Corona and Tacoma, is equally as popular, and also that it has the advantage over the desert races in that the promoters have a chance to at

least break even and possibly to make a little money.

Elgin Most Important Meet

Elgin undoubtedly was the biggest road racing meet of the year, made so by the fluke at Savannah. But Elgin has earned this honor, for it is the only event in the country which has stuck to its guns for 4 years and has used the same circuit continuously. Because of this consistency, the Elgin National trophy now should be regarded as the most important of the American cups, the constant switching of the Vanderbilt having robbed that famous bit of silver of considerable of its prestige. Elgin, it might be added, was fortunate enough to make a snug profit this year, its stockholders receiving a 10 per cent dividend, the first to be declared since 1910.

It is a matter of congratulation that we

have gone through another season without a road racing fatality. Looking back over the record of sixteen events in 1913, we fail to find a single black mark on the debit side of the racing ledger. This freedom from fatalities in road racing, however, is not new, for in the past 5 years there have been few to pay their accounting to the Grim Reaper because of their fondness of this branch of the sport.

Stutz Consistent Performer

Harking back to this year's champions, Cooper and the Stutz, the reviewer will find that the Stutz has made a remarkable record for consistency. It raced at Elgin, Santa Monica, Corona, Tacoma, San Diego, and also in the El Paso-Phoenix road race. As mentioned before, it started fifteen-times in all and only four times was it out of the money. In two of these four times the Stutz won the race anyway. In six of the fifteen starts the car averaged better than 70 miles an hour, its fastest performance being 75.03 m. p. h. at Corona. Its slowest race was in the New Year's day race at San Diego, where Carlson ran third at 44.53 m. p. h., as against the 47.69 of the winner, a Fiat driven by Hill. The general average of these fifteen cars for the 2,862 miles covered was very close to 67 miles an hour. Only two other makes of cars won more than one race during 1913, the Fiat and Buick being credited with two each. Cooper was the only driver out of the sixteen who won their spurs to take more than one race, and he got five.

Cooper has been a long time in winning his spurs, for his first race was driven 13 years ago. But while the Californian is now enjoying national fame for the first time, still he is no stranger on the Pacific coast, where he long has been a consistent performer, although it was not until the last two seasons that he really broke into the limelight. A native of Nebraska, Cooper went to California in 1891 and at present



WATERMAN, WHO WON LIGHT-CAR RACE AT CORONA IN BUICK

is a resident of Los Angeles, where he is in the employ of the Walter M. Brown Co., agent for the Stutz, which he has driven in all of his races since the beginning of the season of 1911. Cooper is 29 years of age and is a cool and calculating driver. As in the case of Harry Grant, he never starts in a race without his plan of action having been worked out to the most minute detail before lining up at the tape, and he always is willing to take a chance.

Cooper was only 17 years old when he drove his first race, and his victory on that occasion lost him his job. At that time he was working for C. H. Letcher, now a prominent dealer in San Jose, Cal., and Letcher had the racing fever. He and Cooper had worked hard in putting a one-cylinder Cadillac in shape for racing at Agricultural Park, San Jose, Letcher having elected to drive the car himself. But Cooper likewise was filled with racing enthusiasm and so, unknown to his boss, he borrowed a one-cylinder Cadillac, owned by a San Jose woman, and entered it in the same meet.

Cooper went to the tape in fear and trembling, finding his boss already there. Letcher took it as a joke and laughed at the boy. The race was a 5-mile event and Cooper, knowing that Letcher's car was the faster of the two, resorted to strategy. Letcher took the lead at the start, but after running a couple of miles he slowed down in order that Cooper might catch up and make the finish an interesting one. Cooper, however, lagged behind until the $3\frac{1}{2}$ -mile post was reached, whereupon he made his run from the rear with the throttle wide open. Cooper caught his boss napping and passed him in a whirl of dust, gaining a lead that his boss was unable to overcome and winning the race hands down.

Cooper reported for work at the garage the next morning, only to find that his victory of the day before had been a costly one, for Letcher declared that no boy could turn a trick like that on him and continue in his employ. Cooper lost his job.

ANOTHER DECISION FOR WEED

New York, Nov. 15.—On appeal from the final decree in equity Judge Coxe in the United States circuit court of appeals for the second circuit has decreed that the product of the Parsons Non-Skid Co., Limited, Weed Chain Tire Grip Co. and Harry D. Weed has been infringed by the E. J. Willis Co. The patent No. 723,229 has been in general and continuous litigation for the last 3 years, and has been sustained and infringement found in twenty-four instances. Appeals have been taken in at least five of these cases, resulting in each case in affirmative of the decree of lower court finding validity and infringement of patent. These decisions are by the circuit court of appeals of the sixth, seventh and second circuits court of appeals of the sixth, seventh and second circuits.

ROAD RACING RECORD FOR 1913 SEASON

Boillot Retains Road Driving Championship of Europe

Peugeot and Delage Win Most Important Races



**GOUX ON RIGHT
BOILLOT ON LEFT
FRANCE'S CHAM-
PIONS**

COOPER'S claims to the American championship are no stronger than those of Georges Boillot to Europe's, for the Peugeot driver, while he did not compete in as many road races as did Cooper, conclusively proved his right to retain the title of champion of speed on the other side of the Atlantic. Boillot successfully defended the honors which he won in 1912 by capturing two of the classics, one of them the grand prix at Amiens and the other the Coupe de l'Auto at Boulogne.

One must associate with Boillot his team mate Jules Goux, winner of the 500-mile race on the Indianapolis speedway, for in both the road events which Boillot won Goux was runner-up. It wasn't a case of team work either that they ran this way, for it only was because of hard luck that Goux was beaten in the Amiens event.

In a way Boillot has

to divide his honors with Bablot of the Delage, who won the secondary grand prix at Le Mans, a race in which the Peugeot was entered but one in which it was scratched after the critics had looked for a conclusive battle between what are regarded as the two fastest cars in Europe—the Peugeot and Delage. Bablot put up a remarkable race in the Le Mans affair and his average of 77 m. p. h. for 336 miles was the fastest of the year on both sides of the Atlantic. The speed possibilities of the Delage were shown when Bablot, delayed at the pit by a balky motor just before starting on his last lap, had to average 85 miles an hour for the final circuit in order to beat Guyot, his team mate.

About as many road races were run in Europe this year as last but, if anything, the interest was keener than in 1912. The Targa Florio, which has stood the test of time and which is the oldest classic in Europe, produced a remarkable battle in which Nazzaro, undoubtedly the greatest driver of all time, proved that it is possible to come back, winning the race. It is worthy of note that Nazzaro also won the Targa Florio in 1908, the year in which he proved his ability by also taking the Emperor's cup race in Germany and the grand prix in France.

Undoubtedly the feature of European racing this year was the staging of two cyclecar road races.

RESULTS IN THE LEADING ROAD RACES RUN IN EUROPE DURING SEASON OF 1913

Seattle's New Speedway to Be 2-Mile Board Track

First Meet Scheduled for July 13-14

SEATTLE, Wash., Nov. 15—Seattle's speedway, announced in Motor Age last week, is to cost approximately \$150,000 and will be ready for the first meet July 13 and 14, when the prize list will total \$30,000, the richest offered in any racing event, with the exception of the 500-mile international sweepstakes at Indianapolis.

Plans have been drawn and contracts awarded for the construction of a 2-mile course on a tract of 180 acres near Renton Junction, in the Black River valley, 11 miles from this city.

The Seattle Motor Speedway Corp., capitalized at \$200,000, all of which is in common stock, and incorporated under the laws of the state of Washington, is sponsor for the project that is intended to put Seattle on the racing map in large letters. The directing genius in the organization is Harry W. Doherty, well known in motor trade circles throughout the United States, having served in the retail and wholesale sales departments of a number of prominent factories during the last 12 years. Doherty successfully planned and conducted the road races at Tacoma in July, 1912.

Everything is in readiness for the beginning of construction work. The contract for grading the course and building the track, stands, buildings, overhead driveways and fences has been awarded. The course will be graded at once and will be permitted to settle through the agency of the winter rains. In the spring it will be rolled.

Imbedded in the solid earth will be heavy cross timbers. On top of these the speedway surface, consisting of planks 4 inches deep and 8 inches wide, will be laid. The planking will be placed lengthwise of the course. The straightaways will be $\frac{3}{4}$ mile long and 60 feet wide. The field on either side will be graded up to the track to eliminate the danger of running off the course. This same idea will be carried out on the inside of the turns.

Engineers who prepared the plans are jealously guarding all data relative to the angles of the curves. It is known, however, that the bends will be gradual, extending over an area of a quarter of a mile and will be highly banked. The turns will be 75 feet wide and will flare up to a point 25 feet higher than the elevation of the inside of the turn. The gradient near the top will approximate 35 per cent, it is understood.

Heavy cross timbers built upon substantial piling will form the foundation of the ends. On top of this will be laid the floor of the speedway, timbers 2 inches wide and 6 inches deep. As in the straightaways, they will be placed lengthwise of the course. Along the outer edge of the

curves will be placed a rigid bulkhead of logs to prevent any car running off the track. Bulkheads also will be placed along the homestretch to safeguard the spectators in the grandstands.

Across the track will be suspended hundreds of huge electric lights which will be used to illuminate the course for 24-hour races and other contests which extend into the night, for it is the purpose of the corporation to make the speedway the center of all motor speed attractions on the Pacific coast.

The wooden course is declared to hold distinct advantages in that it is less exacting on tires than brick or concrete and is free from the vibration that is manifest on paved tracks, a condition which is declared to result in crystallization of axles and steering knuckles. Puget sound knows no extreme heat or cold, so there is no burning sun to aid in the shortening of the life of tires on the racing cars. Weather statistics show that during the last 14 years there has been no rain on July 13 or 14, on which dates the initial racing meet is to be held.

Accommodations for seating 34,000 persons will be provided in the boxes and grandstands. There will be no stairs in the stands, incline walks serving in their stead. Across from the grandstands will be the official pagoda which will house the judges, timekeepers, checkers, press representatives, telegraph operators and telephone switchboard connecting with five points on the course, with various parts of the grounds and the city. Beside the stands and on the inside of the curves will be reserved parking space for upwards of 2,500 cars, while back in the infield and on the back stretch free accommodations for as high as 8,000 cars will be available. Underneath the north and south turns will be built individual garages for thirty racing cars. A machine shop is to be established nearby.

In anticipation of crowds ranging from 75,000 to 100,000 persons, the corporation has made provision for three 50-foot motor car entrances in addition to the paths for spectators who come by steam and electric railways. Two overhead bridges across the course will facilitate the movement of vehicles and spectators from the gates to the infield and in emptying the grounds after races.

The Seattle speedway is ideally situated as regards transportation facilities. It is reached by four transcontinental railways, the Northern Pacific, Great Northern, Chicago, Milwaukee and St. Paul and Oregon and Washington Railroad and Navigation (Harriman) line, and an electric interurban system. They could handle a crowd of 100,000 with the greatest ease. For motorists, the field is conveniently

located, for it is reached from Seattle by an 11-mile drive over the splendid Pacific highway, which extends from British Columbia to the Mexican border line, and the Sunset highway, which reaches from Seattle across the Cascade mountains to eastern Washington, Idaho and Montana.

For support the speedway has a population of approximately 2,000,000 persons within a radius of 150 miles on which to draw.

NO I. M. CO. RECEIVERSHIP

New York, Nov. 15—Judge Garretson, sitting in the supreme court of Kings county, has handed down a decision in favor of the plaintiff in the suit of G. E. Blakeslee, a shareholder, against the International Motor Co. et al. The action grew out of the controversy between the minority and majority stockholders over a proposal to pledge \$1,200,000 of the corporation's assets as security for a loan of \$1,000,000.

The decision states that the continuance of the temporary injunction and the application for a receiver are denied upon condition that the defendant, the International Motor Co., shall give a \$50,000 security bond to indemnify the plaintiff for whatever loss he may sustain pending the trial and judgment of the dissolution action, and shall satisfactorily stipulate that during that time it will not execute a mortgage upon its assets and will not increase its unsecured liabilities by a loan in excess of \$500,000 without leave of the court.

The decision concludes: "Upon failure to comply with these conditions the motion for an injunction is granted and the question of an appointment of a receiver is reserved for a further hearing on a day to be fixed."

Whether the company can secure a loan under the above conditions is not yet known. The meeting of voting trustees, scheduled for Friday, however, has been postponed indefinitely.

POWELL EVANS RESIGNS

Philadelphia, Pa., Nov. 15—Public announcement was made today of the recent resignation of Powell Evans, for more than 4 years president of the Automobile Club of Philadelphia. Mr. Evans during his administration has been a most energetic official and more than any other individual was instrumental in carrying to completion the successful financing of the club's magnificent new club house and garage on Twenty-third street below Market, occupied for the first time last fall. Vice-president Stedman Bent was elected to succeed Mr. Evans to the presidency of the organization and Howard Longstreth was made vice-president.

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“Whatever Is, Is Right”

*All nature is but art unknown to thee;
All chance, direction, which thou canst not see;
All discord, harmony not understood;
All partial evil, universal good.
And spite of pride in erring reason's spite,
One truth is clear, Whatever is, is right.—Alexander Pope.*

THIS extract from Pope's "Essay on Man" adds a gleam of interpretation on the financial horizon of the motor car world today, when the atmosphere is pregnant with bank stringencies, when receiverships are the too familiar gossip of the luncheon table and when rumors are seized upon with too much avidity by the motor car people.



THE motor industry must be surveyed with the eye that grasps its due perspective and not with the compound eye of the insect that distorts the merest detail and entirely misses the comprehensive general scheme. The motor car industry is a world in itself, composed of the weak and strong, the big and the little, the plunger and the conservative, the business man and the non-business boy. It has taken them all, or they all have played their part, in its development to date.



IT is difficult to interpret just what part some of them have played, but if the derelicts of the last 5 years are analyzed, the truth of their failure will be learned, failure generally precipitated by lack of the individual companies harmonizing themselves with the great current of the industry. Years ago one concern bankrupted itself featuring a particular type of gearset, that it apparently thought more of than financial success. The sooner an industry is rid of such would-be manufacturers the better, surely the exit of such a concern can be looked upon as "all partial evil, universal good."



IFT the curtain of the last 18 months and not a few examples of utter business suicide will be found, examples of so-called geniuses endeavoring to pilot organizations, but they themselves not having the rudiments of sound finance in their makeup. Some of these have had good engineering jobs thrust into their hands; but sound engineering is not enough in the merciless industrial seas of today, you must have the three-in-one model—the good proposition, money to finance it and men to execute the enterprise.



UT all of the discord of the last year has not been due to the manufacturer. He can carry his own deeds on his own shoulders, but when influences outside of his own business work against him, then the eye must survey the entire industrial field and see where the discord is that wrecks the general harmony. Some of the financial stringencies of today are due to the errors of a year ago, 2 years ago. The mills of the gods grind slowly, the evils of yesterday are not always punished today, neither are the offenses of today remembered in the justice of tomorrow. The misleading advertising of 2 years ago, and of last year, is being punished today. Inflated tales of unlimited sales that proved wanting when the product actually was ready to be sold are today having their effects on the financial centers. Some of these money concerns, caught napping 2 years ago, are pursuing a different policy today. They were burned once but are going to keep their fingers away from the fire now and in the future. This accounts for

present stringencies, "partial evils," that in the end become "universal good." The banks cannot be blamed for dictating their own terms after their recent experiences, nor can the industry look upon their course as unbusinesslike or discriminatory.



OME of the receiverships of today are due to entirely extraneous conditions, conditions of the statutes of our states; conditions which give to the small creditor the power to harass the manufacturer, to precipitate a receivership, when in truth the company is in a solvent and sound financial condition. Indiana is one state in which the maker suffers particularly in this respect, and it is a fact that some of the receiverships in that state today would not have taken place had the concern been located in any other state. This must not be construed that Indiana does not give the creditor as good protection as do other states but rather that the inconsiderate creditor, be he small or great, has within his reach the power to harass and upset a maker, when his plan is entirely out of harmony with that of all the major creditors.



“WHATEVER is, is right,” must still continue and if receiverships continue to come, all will be for the eventual good. The majority of makers have claimed for years that we had too many makers, England makes the same claim today, so does France, so does Germany, and yet when in the normal course of events the elimination of some begins, the flurry signal is run up, an entirely unnecessary formality, a very dangerous signal. Sit tight, keep your ear to the ground to interpret the pulse of the future, look to the future and decipher the demand, get in the right channel, then put on full power ahead. The pilot who knows his course has no fears in the storm in midocean; the terrors are with those who do not know their course, who are trying to pilot their ways through unknown waters.



Underground Garages

TRAFFIC conditions in the larger cities of the United States are becoming so serious that the authorities have turned their attention to the problems that now confront them. First and foremost of these problems is the one that has to do with the parking of motor cars in the business districts, an especially serious problem in cities like Chicago, New York, Detroit, Boston, Milwaukee and Indianapolis where the demands of traffic on the downtown streets have become abnormal. Much of this traffic congestion is caused by the leaving of motor vehicles standing at the curb all day, thus shutting off vehicular trade of the business houses—transient motorists, one might say—the citizens who do their shopping in motor cars and who are entitled to the use of the curb but who cannot get to the sidewalks because of the encroachments of those who drive to business and use the city streets for garage purposes.



HOW to so adjust matters that both classes may be cared for is the problem and it would seem as if the solution lies in the underground garage, first proposed by Chicago and now being considered in Detroit and Indianapolis. There is far more to such a proposition than might appear at first glance and it would not seem to be a wild prophecy to predict that this will be brought about within a few years. Such garages, handled by municipalities, should charge only very moderate fees.

Foreigners Take Kindly to Cheap American Car

American Consuls Report on Continental Situation

WASHINGTON, D. C., Nov. 18.—The use of the motor car and truck is rapidly increasing in all countries, while the outlook for the cheaper American cars is improving, according to the Consular and Trade Report of this date. Germany is especially prosperous in the motor car line, the percentage of increase in the number of cars in use being higher than in any previous year. About 24,000 cars were built in 1912, while some 3,000 were imported. In Italy 7,330 cars were produced in the same year and 1,005 imported while the American light cars are increasing in number.

Denmark is reported as having 8,000 cars in use, one for every 400 of population, one-third of these cars being of American make. The preference is shown for cars of low upkeep. The interest in cyclecars is very marked, most of these being German three-wheelers which work admirably on the good Danish roads.

Portugal Has Few Cars

Portugal, with a population of 6,000,000, has fewer than 2,000 cars in use from the following countries: France, 966; Italy, 384; Belgium, 154; England, 145; Germany, 137; United States, 75; Switzerland, 15; Netherlands, 5; Spain, 1; Denmark, 1; Total, 1,883. About 500 cars were imported in 1912 as against 300 the year before so that interest is increasing. Russia is making almost no motor cars though the imports in 1912 amounted to more than 5,000,000. About 3,500 cars were imported and but 100 made in Russia. The Fiat company has a branch factory in Russia. Seventeen per cent of the machines imported were motor trucks which showed the greatest gain.

The report from France mentions briefly the cyclecar and motorcycle gain but presents no figures on the motor car. The report from Spain is given over to publicity on a new spring tire device to be tested by the military authorities soon.

The imports to Norway are greatly increasing. Christiania the main port of entry received more than double the number of cars in 1912 which came in in 1911. These amounted to \$247,364 or more than to the entire country the year before.

The increasing interest in the American car is worth notice, this being almost entirely in connection with the small types of low prices, a field not catered to by foreign manufacturers, except in England where the new cyclecar movement has brought out a large number of small cars—but few cyclecars.

The competition of American cars in Germany has not as yet been felt for, says the report. The German buyer prefers and will prefer to pay a little more for his car which he can use for a number of years

than to buy a cheap American car which may not render the same service. In direct contradiction to this statement there follows the remark that the upkeep and operating expenses for a car is so important an item that these are likely to be considered rather than the mere question of original cost.

The main American competition, it follows, will be in the motor truck field rather than in passenger cars. Altogether the report so overdoes the arguments proving the American car to be out of the question that one might imply a fear that there was some feeling in the matter after all. The report from Saxony states that there is a distinct field for the American cars if direct agents could be in charge.

Italy presents a different criticism, while admitting a ready market for American cars, the original order for five cars disposed of at the Milan exhibition is considered worth notice, and an indication of a field and demand.

The upholstery of American cars is criticised as being too sloppily done, leaving seams, scratches and nail heads exposed. The dark color of the cars consumes much of the space of the criticism, for with the Italian buyer the idea is against the stern businesslike appearance of the dark colors and cries for bright colors and better polished accessories which "give the passerby the opinion of prosperity." The metric system also is advised for the measuring and manufacturing of parts, as the inch system is confusing. Also speedometers should read in kilometers, for reasons which are obvious.

Denmark Likes Yankee Product

Denmark openly approves of the American cheap cars, the average buyer, it is said, looking more to upkeep cost than to first price, and hence preferring the light cars of low horsepower. This has brought many of the German three-wheeled cyclecars into use, these being very applicable to the smooth perfect roads of the islands. These sell particularly to the younger generation.

Portugal is favorable to American cars but cites the freight rates and the nearness of European markets as against them, the former being high and the latter making it easier to get repair parts of European cars.

In Russia the American car has had favor, especially about Odessa. The distances between towns in Russia are long and the railways and trams infrequent, so that motor cars are a necessity. The cars most favored are those for which spare parts can be most quickly had. In 1912 there were registered seventeen American makes, thirteen German, fifteen French, one Austrian, two Italian and ten British. France is cited as a field open for mak-

ers of sidecars for motorcycles, most of those now bought in this country being of English make. The motorcycle is comparatively new in France as a sport, and has only recently waked up to any proportions. The cyclecar has not as yet taken a strong hold, as the factories turning these vehicles out are very cramped at the present time and are not pushing the movement with vigor. The press as well has not as yet taken the movement up with any aggressiveness. Another year will see a growth in the new line.

Norway would seem to be an open field for American cars, and the country offers no criticism of the cars or business methods used in handling them. The roads of Norway are very narrow, beautifully surfaced, and with long distances between stops. There should be a great demand for narrow tread cyclecars for these roads.

ST. LOUIS CONVENTION A FIZZLE

St. Louis, Mo., Nov. 14—The United States Good Roads Association convention was adjourned here after 5 days of sparsely attended sessions. Tulsa, Okla., was selected as the 1914 meeting place. The convention was one "grand fizzle and shame," to quote one delegate. It had been widely advertised that 6,000 delegates would be in attendance with twenty-eight governors and nearly a hundred mayors from different states and cities, but when the meeting was called to order Monday but one governor and one mayor were among the 300 delegates that answered to the roll. Governor Major of Missouri, who was the only state executive in attendance, left the city to take a hunting trip Wednesday. Henry W. Kiel of St. Louis was the attending mayor.

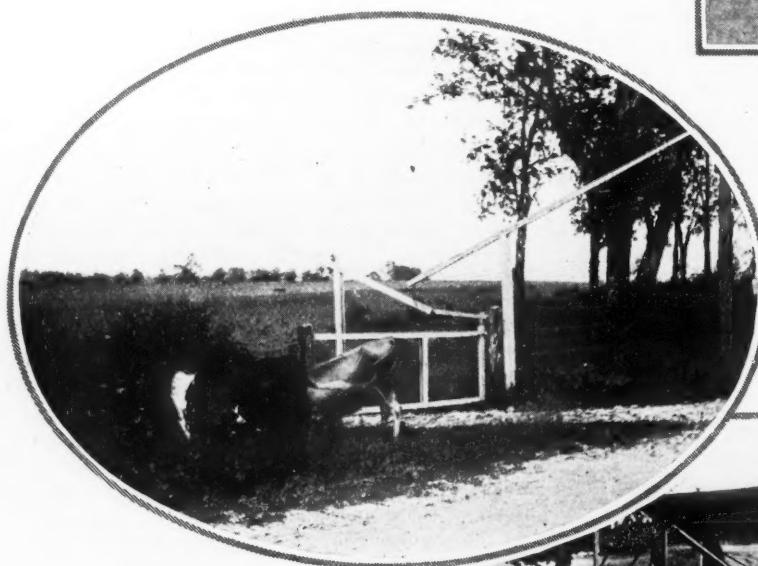
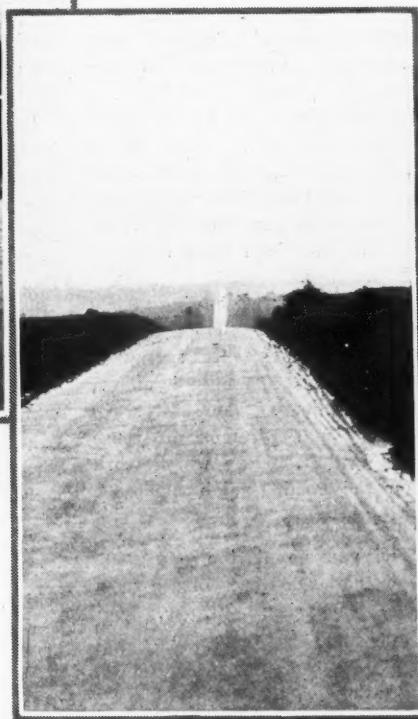
The few delegates who came from varied parts of the country were disgusted and departed during the week, leaving only fourteen delegates, who finally today—Friday—adjourned the convention with but one endorsement or resolution passed.

DECISION IN RAJAH PLUG CASE

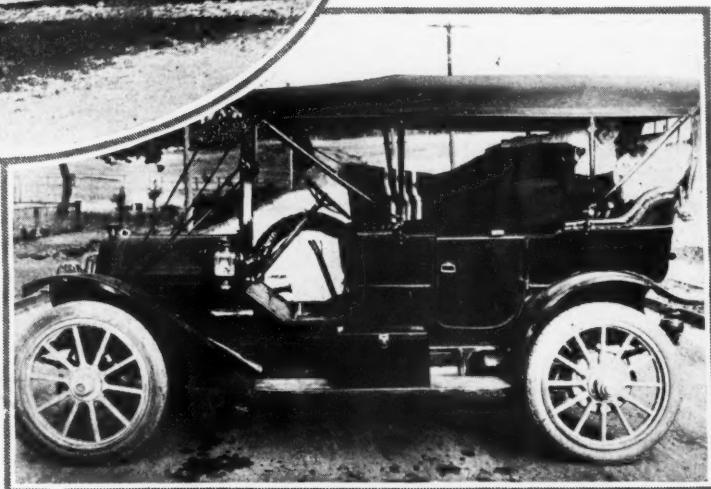
New York, Nov. 19—Special telegram—Circuit Judge Ward, United States Court of Appeals, has rendered an opinion in the suit of the Rajah Auto Supply Co. vs. Rex Ignition Mfg. Co., sustaining the validity of the Rajah company's restricted license. Restriction is that no porcelain or other part not made by Rajah company shall be substituted in Rajah plugs. Various dealers have contended this restriction was not enforceable. Judge Ward's opinion not only sustains validity of restriction, but holds it contributory infringement of Mills patent No. 825856, to sell porcelains for substitution in Rajah plugs unless these porcelains are made by the Rajah company. Judge granted preliminary injunction.



On July 4, 1914, while firecrackers are popping all over this country, exhausts will be popping in the vicinity of Lyons, France, the scene of the next grand prix race. Over such roads as are shown in the two upper illustrations on this page, France, Germany, Italy, England and Belgium will meet in an international speed battle and Georges Boillot, dean of the Peugeot team, will attempt to win the grand prix for the third consecutive time. Thirty thousand dollars will be spent improving the 23.3-mile course.



Owners of country estates who are also owners of motor cars have long been puzzled over the nuisance of stopping the machine in order to open the gate into the side-road. Down near Winchester, Ky., however, they have solved the problem with the easy gate-opener. Extending far enough out toward the road, in each direction, is the long white pole, resembling some old-time toll-gate. Attached to this in turn is a rope, within easy reach of the motorist.

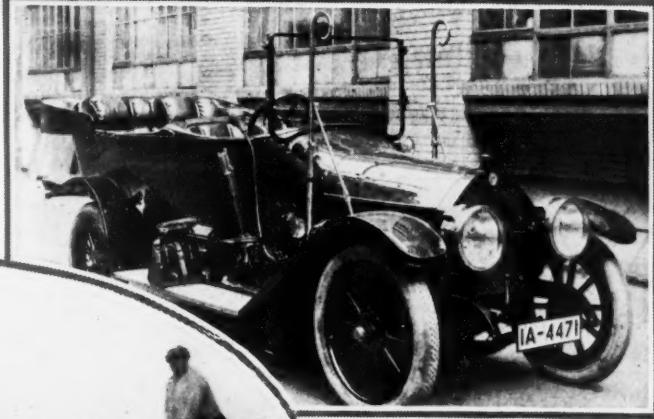


Touring independent of wayside inns or the luxurious hotels of cities can be indulged in by the motor traveler by means of a berth, which is to the motor car what the Pullman berth is to the railroad car. It utilizes the seat cushions, as does the Pullman, and by means of an ingenious frame spreads them level, while a stout canvas covers the cushions and projects over the front seat for a foot extension. The bedding and the frame can be made up into a small package that is readily stowed away. This outfit, with a basket of lunch and a thermos bottle, makes the long-distance motorist snap his fingers at schedules.



Evidently the Parisian matron is not jealous of her husband's stenographer. We arrive at such a conclusion after looking at the two upper illustrations on this page showing the tired business man dictating to his amanuensis while touring with her in a cycle-car. These pictures were taken during a recent commercial exposition in the French capital to show the efficiency of the small portable typewriter.

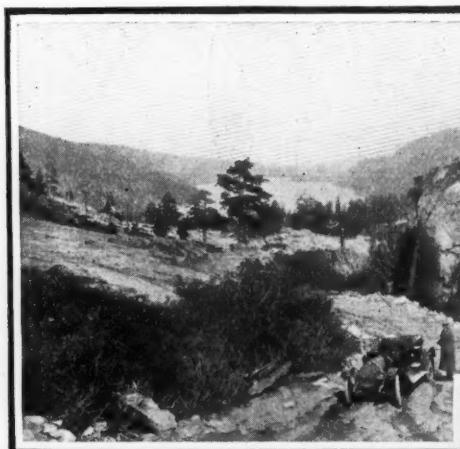
German motorists need no longer shun at night the Grunewald forest, near Berlin, where mischief-makers have stretched cables or hemp ropes to suddenly stop the progress of touring parties. As a safeguard against such willful road accidents J. W. Uttermöhle, of Berlin, has designed a device consisting of two vertical rods, placed at either side of the hood, having sharp edges to cut through thin ropes or cables and at the top bent forward to catch heavy cables and save the occupants of the car from decapitation.



While inspecting the Los Angeles-Phoenix road race course, Barney Oldfield almost collided with an 1849 model, rated at 2 mule-power and equipped with a one-man top of weather-stained canvas. "I may have ridden in that make," Barney remarked, "but if I did, I was too young to remember what my time was and if the A. A. A. allowed the record."

Routes and Touring Information

By Motor in Wake of the Donner Party



DONNER LAKE IN DISTANCE NEAR WHERE PIONEERS CAMPED



TYPICAL SCENE IN EMIGRANT PASS, AN HISTORIC SPOT



THROUGH THE SNOW SHEDS LOOKING ACROSS EMIGRANT GAP

FAIR in its brief summer, but furious in its long winter, is that rugged stretch of the California Sierras, westward from the town of Truckee near the Nevada line, past Donner lake, over the divide and then through Emigrant Gap, and still many mountainous miles away before all that suggests hardship has been left behind and the certain golden day has been attained.

This is one section of the great west that can serve as refutation when the "See America First" slogan meets the laconic lazy reply, "You have no history."

The Scene of a Tragedy

"The Donner Party" was written in 1879 by C. F. McGlashan after much research work. Thus opens its first chapter:

Three miles from Truckee, Nevada county, California, lies one of the fairest and most picturesque lakes in all the Sierra. Above, on either side, are lofty mountains, with castellated granite crests, while below, at the mouth of the lake, a grassy, meadowy valley widens out and extends almost to Truckee. The body of water is 3 miles long, 1½ miles wide, and 483 feet deep.

Tourist and picnic parties annually flock to its shores, and Bierstadt has made it the subject of one of his finest, grandest paintings. In summer, its willowy thickets, its groves of tamarack and forests of pine, are the favorite haunts and nesting places of the quail and grouse. Beautiful, speckled mountain trout plentifully abound in its crystalline waters. A rippling breeze usually wimples and dimples its laughing surface, but in calmer moods it reflects, as in a polished mirror, the lofty, overhanging mountains, with every stately pine, bounding rivulet, blossoming shrub, wavering fern, and high above it, on the right, the clinging thread-like line of the snow-sheds of the Central Pacific (now Southern Pacific). When the railroad was being constructed 3,000 people dwelt on its shores, the surrounding forests resounded with the music of axes and saws, and the terrific blasts exploded in the lofty, overshadowing cliffs, filled the canyons with reverberating thunders, and hurled huge boulders high in the air over the lake's quivering bosom.

In winter it is almost as popular a pleasure resort as during the summer. The jingling of

By Paul Gyllstrom

sleighbells, and the shouts and laughter of skating parties, can be heard almost constantly. The lake forms the grandest skating park on the Pacific coast.

Yet this same Donner lake was the scene of one of the most thrilling, heart-rending tragedies ever recorded in California history. Interwoven with the very name of the lake are memories of a tale of destitution, loneliness and despair which borders on the incredible. It is a tale that has been told in many a miner's cabin, by many a hunter's campfire, and in many a frontiersman's home, and everywhere it has been listened to with bated breath.

Story of Early California

From Donner lake, through Emigrant Gap, there is probably not a mountain peak or canyon that did not at some time during that fateful winter of 1846-47 look out upon various straggling bands of people, emaciated, but struggling against starvation that appeared certain to overtake them. They were but part of the original company of ninety that left Springfield, Ill., early in April, 1846, taking up the glorious cry: "Ho, for California." But only forty-eight reached the goal, and most of them suffered experiences that make one marvel at the limits of human endurance.

It is a story that precedes the gold days of California, and it is so filled with

fascinating horror, it always must remain a stirring chapter in the state's history. It is a tale of intense grief and woe, now and then embellished with the most sacrificing deeds of heroism by men and women.

A Delightful Motor Drive

On a July or August day Donner lake is charming to look upon. A good road skirts its northern shore. On the opposite mountainside still cling the snow-sheds, charred by the changing seasons and the smoke of locomotives. This black, serpentine line is constantly in sight of the motorist until he finally leaves the eastern end at the town of Emigrant Gap, 40 miles away.

The road by Donner lake is so smooth in summer that the tires as they touch the scarcely yielding sand, seem to hum in tune with the soft purr of the motor. In a few minutes the motorist is at the head of the lake, and after passing through a tamarack meadow, the climb towards the summit is started. As one reaches an altitude of 1,500 feet higher than the lake, now 5 miles to the east, one pauses when reminded that the Donner party stopped in this vicinity. The chronicler writes:

"Never, from the moment the party encountered the first difficulties on the Hastings cut-off until this fatal night in November, did the members of the company ever agree upon any important proposition."

Now they agreed to return to the lake and make an early start the next day to cross the summit. That night a premature Sierra winter in all its fury was

ushered in, continuing for several days, a gruesome herald of weeks of privation, terror and death.

By motor, what an easy task on a summer day! The sun may burn a bit and the dust may be mildly distressing, but ordinarily the breeze is cooling. One dodges in and out through the snow sheds, bobbing up and down at varying altitudes from 5,000 to 7,000 feet, skimming close to scenery that is superb, and over a smooth road in the gap that rolls as on a prairie. Down there between the towering mountains one can nearly keep pace with the smoke one sees filtering through the sheds.

Seven of Party Survive

The "forlorn hope" party, the first to attempt to reach the settlements, after minor futile efforts had been made to attain the summit, consisted of fifteen persons, men and women. Seven lived through it, five women and two men. The entire Donner history indicates the greater resistive power on the part of the women in such unusual distress. It has been recorded that the seven reached Johnson's ranch after having been at the verge of death by starvation five times. W. H. Eddy, tottering between two helpful Indians, was the first person to safety and the other six were rescued 15 miles to the rear. They had traveled more than a month across the deep snow.

The motor sings merrily up and down grade and needs not starve if the driver has been careful of his supply at Truckee. One can leave the old town early in the afternoon in a small car, spend the necessary time for the taking of a few photographs, and after consuming about 6 gallons of gasoline, the twentieth century emigrant may about 7 hours later be tucked in a comfortable bed at Sacramento, 135 miles away.

The Donner party was badly mismanaged and chaotic conditions prevailed after the first snowfall, which seemed to numb the faculties of the men. While the original party numbered ninety, others crossing the plains from time to time joined in, and it is said the train at one time numbered 250 prairie schooners, and when in motion, was 2 miles long. But many dropped off, sought other ways, and it was pretty much the original party that was trying to make its way past Donner lake.

C. T. Stanton left the Donners at the Hastings cut-off, hurried ahead when it appeared the party would be doomed. From Captain John A. Sutter, at what is now Sacramento, he and a party received supplies, returned to the lake, became imprisoned and suffered all. Stanton perished as a member of the "forlorn hope" party. James F. Reed killed John Snyder in an altercation at Gravelly Ford, was banished and compelled to leave his family of five. Mrs. Sarah Keyes, Mrs. Reed's mother, died before the mountains were reached, but the remainder of the

family survived. Reed continued his lonely way, past the lake before the snows set in. But he realized what would happen and organized the second relief party back to the lake. It is said that Reed's family was the only one of which no member tasted human flesh.

Reasin P. Tucker, who died a few years ago at Santa Barbara, was at one time a member of the greater party, but came over the old trail. He led the first relief party which endured many hardships.

William M. Foster, who came through with the "forlorn hope" led the third relief party and was a member of the fourth, thus crossing the mountains five times that dreaded winter.

The remaining Breen family of seven, two children having been taken out by Tucker, with Mary Donner and three Graves children, all of whom lived through it, were of the second relief, and after Reed and others pressed on in what appeared a hopeless case, remained at Starved Camp, in a hollow somewhere near Summit Valley in the gap. Reed had his 8 year old daughter Martha J. (Patty) Reed along, and it has been established that she carried her doll the entire trying journey. She later became Mrs. Frank Lewis, of San Jose.

The story of the party left at Starved Camp is one of the most heart-rending of all and leads to the heroism of John Stark, including as it does that of a woman, the wonderful mother, Margaret Breen. The following is from an account by a Mrs. Farnham, written as early as 1849:

Starved Camp Without Food

There was no food in Starved Camp. There was nothing to eat save a few seeds, tied in bits of cloth, that had been brought along by someone, and a precious lump of sugar. There also were a few teaspoonfuls of tea. They sat and lay by the fire most of the day. They were upon about 30 feet of snow and had no words of cheer to speak to each other, no courage or hope to share, but those which pointed to a life where hunger and cold could not come, and their benumbed faculties were scarcely able to seize upon a consolation so remote from the thoughts and wants that absorbed their whole being.

A situation like this will not awaken in common natures religious trust. Yet the mother's sublime faith, which had brought her thus far through her agonies, with a heart still warm toward those who shared them, did not fail her now. She spoke gently to one and another, asked her husband to repeat the Litany, and the children to join her in the responses; and endeavored to fix their minds upon the time when the relief would probably come.

What days and nights were those that went by while they waited! Life waning visibly in those about her; not a morsel of food to offer them, her own infant—and the little one that had been cherished and saved through all by the mother now dead—wasting hourly, her husband worn to a skeleton; it needed the fullest measure of exalted faith, of womanly tenderness and self-sacrifice, to sustain through such a season. She watched by night as well as by day. She gathered wood to keep them warm. She boiled the handful of tea and dispensed it to them, and when she found one sunken and speechless, she broke with her teeth a morsel of the precious sugar, and put it in his lips. She fed her babe freely on snow water and scanty as was the wardrobe she had, she managed to get fresh clothing next to its skin two or three times a week. Where, one asks in wonder and reverence, did she get the strength and courage for all this?

Thus she went on. The tea leaves were eaten, the seeds chewed, the sugar all dispensed. The days were bright, and compared with the nights, comfortable. Occasionally, when the sun shone, their voices were heard, though generally they sat or lay in a kind of stupor from which she often found it difficult

to arouse them. When the gray evening twilight drew its deepening curtain over the cold, glittering heavens and the icy waste, and when the famishing bodies had been covered from the frost that pinched them with but little less keenness than the unrelenting hunger, the solitude seemed to rend her very brain. Her own powers faltered. But she said her prayers over many times in the darkness as well as the light. After the turning of the night she always sat watching for the morning star, which seemed every time she saw it rise clear in the cold eastern sky, to renew the promise, "As thy day is, so shall thy strength be."

Their fire had melted the snow to a considerable depth and they were lying on the bank above. Thus they had less of its heat and found some difficulty in getting the fuel she gathered to burn. One morning after she had hailed her messenger of promise, she looked as usual over the white expanse that lay to the southwest to see if any dark moving specks were visible. With a heavy heart she brought herself back from that distant hope to consider what was immediately about her. The fire had sunk so far away that they had left but little of its heat the last two nights, and casting her eyes down into the pit whence it sent forth a dull glow, she thought she saw the welcome face of beloved mother earth. She immediately aroused her eldest son, John, and sent him down. He reached the bottom in safety and presently spoke to her. There was naked dry earth under his feet; it was warm and he wished her to come down. She laid her baby beside some of the sleepers and descended. Immediately she decided upon taking all down. By perseverance, by entreaty, by encouragement and with her own aid, she finally got them into this snug shelter.

Relief came not, and she and her children were now, indeed, reaching the utmost verge of life. The eighth day was passed. On the ninth morning she ascended to watch for her star of mercy. Clear and bright it stood over against her beseeching gaze, set in the light liquid blue that overflows the pathway of the opening day. She prayed earnestly as she gazed, for she knew there were but few hours of life in those dearest to her. If human aid came not that day, some eyes would be closed in death before that star would rise again.

Her eyes were dim and her sight wavering. She went below with a heavier heart than ever before. She had not a word of hope to answer the languid, inquiring countenances that were turned to her face and she was conscious that it told the story of her despair. Yet she strove with half-insane words to suggest that somebody would surely come to them that day. She felt she could have died had she let go her resolution at any time within the last 48 hours.

They repeated the Litany. The responses came so feebly that they were scarcely audible, and the protracted utterances seemed wearisome. At last it was over, and they rested in silence.

The sun mounted higher and higher in the heavens, and when the day was 3 or 4 hours old she placed her trembling feet again upon the improvised ladder to look out once more. The rays of the sun fell on her with a friendly warmth, but she could not look into the light that flooded about her. Her eyes lacked strength and steadiness. The enfeebled will no longer could rule over them. She had broken perceptions, fragments of visions, contradictory and mixed; recollections of plenty and rural peace came up from her clear, tranquil childhood. She lived through all the phases of her simple life in the few moments of repose after the dizzy effort of ascending. Then the present came back to her and she thought of the miserable ones down there—for them her life came back. At thought of them she turned her face listlessly the way it had often gazed. But this time something caused it to flush as if the blood, thin and cold as it was, would burst its vessels! What was it? Nothing that she saw, for her eyes were quite dimmed by the sudden access of excitement. It was the sound of voices. Was it reality or delusion? It came again and again. She grew calmer and she became more assured, and the first distinct words she heard were:

"There is Mrs. Breen alive yet, anyhow."

Relief Party Arrives

In the third relief party were W. H. Eddy, W. M. Foster, of the "forlorn hopes"; Hiram Miller, of the second relief party, who had just come through with the Reeds; William Thompson, Howard Oakley, Charles Stone and John Stark. It was decided that the last three should remain at Starved camp, while the others press on to the lake.

None of the eleven, except Mrs. Breen and John Breen, was able to walk. A storm appeared to be gathering in the

mountains and the supply of provisions brought by the third relief party was very limited. The lonely situation, the weird desolate surroundings filled the minds of Oakley and Stone with terror. When it was found that nine would have to be carried it is hardly to be wondered at that a proposition was made to leave a portion of the sufferers, equivalent to death penalty. It was proposed to take Mary Donner and the three Graves children. The members of the third relief party are said to have taken a vote on the question. John Stark's name was the last called because he had during the discussion strongly opposed abandonment. When his name was called he made no answer until someone asked him: "Stark, won't you vote?"

Stark had, during the proceedings, stood apart from his companions with bowed head and folded arms. Directly appealed to, he answered firmly and promptly:

"I will not abandon these people. You can all go if you want to, but I will stay."

Stark Is Left Behind

Stark was finally left alone, according to the manuscript of John Breen. Stark was an unusual man, physically and intellectually. He had the strength of two ordinary men. On his broad shoulders he carried the provisions, most of the blankets and most of the time some of the weaker children. Frequently he would carry one or two ahead a little way, put them down and return for others.

James F. Breen, who later became superior judge of San Benito county, wrote: "I distinctly remember that myself and Jonathan Graves were both carried by Stark, on his back, the greater part of the journey." All reached Sutter's fort alive.

Stark later became sheriff of Napa county and served in the state legislature. He died near Calistoga of heart failure in 1875. Death came while he was pitching hay.

When the other members of the third relief party reached Donner lake they heard tales of suffering and gruesome experiences which need no superlatives to enhance their horror. The principal members of the Donner family died there.

George Donner Wealthy Man

George Donner was wealthy and shortly before he started for California he sold a quarter section in what is now the city of Chicago for \$10,000. George Donner naturally came by his pioneer spirit. The family was of North Carolina, immigrants to Kentucky in 1818, subsequently to Indiana, and were among the first settlers in Sangamon county, Ill. Tamsen Donner, his wife, was well educated and an unusual woman. Her husband lay critically ill at Alder creek when the third relief party arrived. She would not abandon her dying husband, but turned her children over to them after a tearful farewell, walked towards her camp and never looked back. Jacob Donner was a brother. The two families numbered sixteen, seven of whom

survived, all children. It is here written:

"When the June sunshine gladdened the Sacramento valley three little barefooted girls walked here and there among the houses and tents of Sutter's fort. They were scantily clothed, and one carried a blanket. At night they said their prayers, lay down in whatever tent they happened to be, folding the blanket about them, fell asleep in each other's arms.

Begging for Food

"When they were hungry they asked food of whomsoever they met. If anyone inquired who they were, they answered as their mother had taught them: 'We are not.' But they added something they had learned since. It was 'and our parents are dead.'"

The fourth relief party rescued Lewis Keseberg, who, because of alleged incidents, became a lonely and despised survivor.

Patrick Breen and family, who came originally from Keokuk, Ia., remained at Sutter's fort until 1848 when they moved to near the San Juan Bautista mission in San Benito county. The family of descendants now probably numbers half a hundred, most of them living in that vicinity. Many of the survivors settled

near the missions in that section of the state. The original Breeses were long-lived, the father being the first to die, in 1868. The heroic mother passed away April 13, 1874, ripe in years and beloved by all. She had many virtues and remained deeply religious.

Where Gold Was Discovered

John A. Sutter, who fitted out most of the relief parties, never failing to respond when called upon, is known as the benefactor of the Donners. It was at his mill in January, 1848, that Jim Marshall made the discovery that resulted in the gold rush to California. Much of the country through which the survivors made their way from the lake to Sutter's fort was later torn up in the mad search for the precious metal, and from the splendid roads improved by Placer county can be seen jagged and wounded hillsides, evidences of the thousands of men who, with pick and shovel, scrambled for wealth in the years that immediately followed the Donner horror.

Rich as proved many a strike, history will probably accept as the most precious nugget the Sierras ever knew, that which Mrs. Breen treasured—a little lump of sugar.

Ohio Tag Fee Decision Important One

Debate Over Its Interpretation

COLUMBUS, O., Nov. 15—The decision of Judge Kinkead in the Franklin county courts last week has a far-reaching effect on motorists in Ohio. The decision in fact enjoined Secretary of State Graves from collecting the registration fees, based on horsepower of motor vehicles as prescribed in the Warnes law, which was to become effective January 1, 1914. The injunction was allowed on the grounds that it was double taxation and that more fees were required than was necessary to pay the operating expenses of the state motor car department.

There is a great question if the decision really affected the old motor law, and if that statute still stands. The old law, providing for a flat rate of \$3 for electrical vehicles and \$5 for gasoline vehicles, was supposed to have been repealed after January 1 by the new law. While the court did not make a decision on that question the consensus of opinion is that the old law really was repealed, and that after January 1 there will be no registration law on the statute books of Ohio, unless the decision of Judge Kinkead is reversed by the higher tribunals of the state.

The officers and attorneys of the Ohio Automobile Association which fought the case against the horsepower law advise that no registration fees of any sort be paid as long as the injunction suit is pending. What will be done in the future is a question to be taken up when the time comes.

In his decision it was shown that the cost of registering each and every motor car in the state is 83 cents, and that fees from \$6 to \$18 is entirely unreasonable and illegal.

The attaches of the office of the attorney general maintain that the Kinkead decision does not invalidate the former law, and that after the first of the year the same fees for registration can be collected. It may be that in case the court upholds that contention steps will be taken to have the former law declared unconstitutional upon identically the same grounds upon which the Warnes case was won.

At a meeting of the executive board of the Ohio Automobile Association at Columbus today the attorneys, consisting of D. C. Saviers of Columbus, Harry L. Gordon of Cincinnati and Richard H. Lee of Cleveland, were commended for their victory, and additional authority was given them to proceed in any manner they saw fit in the future. In other words, unlimited authority was given them.

One of the important features of the meeting of the executive board was the organization of a good roads committee to act in conjunction with all good roads organizations in the Buckeye state. The organization consists of a committee, one from each county of the state, whose duty it is to look after road matters in their respective sections. Aid will be given by the state officers to secure the improvement of roads whenever needed.

Gasoline War Cuts Prices in Missouri

Clash of Interest Brings 3-Cent Drop

ST LOUIS, Mo., Nov. 17—A cut in prices of 20 per cent on coal oil and gasoline marked the firing of the first gun in the war for the oil business in this state between the Standard Oil Co. of Indiana and the Pierce Oil Corp. of Texas. On November 10 the Indiana concern lowered its price on coal oil 2 cents, reducing the cost per gallon from 9 to 7 cents. Prices in gasoline tumbled 3 cents, dropping from 17½ to 14½ cents per gallon. The next day the Pierce company issued price lists to the trade announcing a like reduction and promising further reductions when the parent body made concessions.

The war is the outcome of the fight made against the Standard interests by H. Clay Pierce, of St. Louis, president of the Texas corporation. Pierce formerly was president of the Waters-Pierce Oil Co. of Missouri, a subsidiary of the Standard. When the Standard was ordered out of the state by the Missouri supreme court, Pierce started a fight to gain control of the Waters-Pierce company. After much litigation he, with the aid of the Rothschilds banking firm of London, England, finally secured controlling interest and incorporated the Pierce corporation in Texas.

The Standard then sought modification of the supreme court decision but was refused. Later, however, it was permitted to return to the state "on its good behavior."

Officials of both concerns in the city at present refuse to say whether or not the prices will be cut here further. However, men close to the powers say it is hardly probable that another cut will be made in the immediate future.

LITTLE HOPE FOR R. C. H. CREDITORS

Detroit, Mich., Nov. 17—A meeting of the creditors of the R. C. H. Corp., which was declared bankrupt on November 5, was held with the referee in bankruptcy, Lee Joslyn, today, at which it was shown that little or nothing will be recovered by these creditors of the defunct concern who, on October 25, 1912, agreed to waive their claims in favor of corporations which would supply materials to continue the business under a creditors' committee. These creditors are the largest creditors and represent claims to the amount of \$1,372,259, and in waiving this amount the intention was to put the concern back on its feet as a going proposition so as to get all of their money back. The preferred creditors, who have claims to the amount of \$270,777, and those who did not sign the agreement of a year ago, with claims of \$24,380, will in all probability get from 50 to 75 cents on the dollar, according to the developments at the meeting, when Referee Joslyn gave it as his opinion that not more than \$400,000 will be realized

from the sale of the factory property and from the profits which have come under the management of the creditors. As a going concern, the R. C. H. Corp. would sell for about \$1,000,000, according to the referee. Its assets are appraised at \$1,346,882.

Referee Joslyn refused to confirm the sale of November 6, when the property was auctioned by the Security Trust Co., receiver, and a bid of \$135,000 received. The receiver opposed the acceptance of this bid, and the referee and creditors agreed that the amount was far too small. The Harris Bros. Co. guaranteed \$140,000 for the fixtures and \$60,000 for the land. This means that if the bid is accepted, creditors will get at least \$200,000 and as much more, minus commission, as the Harris company is able to realize from liquidating the property.

GOODWIN WOODS SALES DIRECTOR

Chicago, Nov. 17—The Woods Motor Vehicle Co., manufacturer of the Woods electric, announces the appointment of H. L. Goodwin as general sales manager, with headquarters at the general office of the company in Chicago. W. A. Simonson is announced as general sales manager in personal charge of the distributing agencies throughout the United States.

GARFORD SUED BY ROLLS-ROYCE

New York, Nov. 18—In the United States district court of the southern district of New York Frederick H. Royce, of the Rolls-Royce, Ltd., Lancaster, England, claims the Garford car has certain infringements of the Rolls-Royce car and he has brought a complaint against the R. & L. Co., New York agent of the Garford cars. He claims infringement on certain new improvements in motor vehicles, consisting of an improved method of mounting such parts of the power mechanism as the motor, the changespeed gearing in the frame, adapted to carrying the same, involving United States patent No. 888,535, granted on May 26, 1908.

HUB HOLDING ELECTRIC SALON

Boston, Mass., Nov. 17—The first electric motor car salon opened today in Boston under the auspices of the Electric Motor Car Club of this city in the ballroom of the Copley Plaza hotel. There are nine makes of cars and three types of batteries exhibited. The total number of machines in the hall is twenty-eight. As the price of admission is \$1 and there are no souvenirs, etc., only the people really seeking to get an idea of what electric vehicles are like are visitors. Rauch & Lang have four models; Detroit electric four; Waverley four; Baker four; Buffalo-Babcock three; Woods three; Ohio two;

Bailey three; Standard one. The greater number are closed broughams or coupes, each exhibitor limiting the open cars to one roadster, except the Bailey, which is showing a touring car with stream line body not unlike one of the gasoline models of 1914. The batteries exhibiting are the Edison, Exide and Philadelphia.

BAY STATE ACTS ON POPE CASE

Boston, Mass., Nov. 15—Judge Aldrich of the United States district court at Boston has appointed Colonel George Pope, treasurer of the Pope Mfg. Co., and Charles A. Morss of Boston receivers for the Pope company in the Massachusetts jurisdiction. The receivers are to make a preliminary report to the court on December 1. Boston interests were opposed to the selection of Colonel George Pope as sole receiver. Mr. Morss was agreed upon as co-receiver with Colonel Pope.

ELECTRIC PLANT REPORTED SOLD

Chicago, Nov. 18.—According to reports from Toledo, Ohio, the Carl Electric Vehicle Co. of that city, recently incorporated with a capital of \$300,000, has purchased the machinery and good will of the Chicago Electric Motor Car Co. and will move the entire plant to Toledo.

Alfred Leopold, a local financier, who, with Abe Meyer, holds the majority of the stock in the Chicago Electric Motor Car Co., refused to confirm or discuss the sale this morning upon his return from an eastern trip. Officials of the company, however, have partially confirmed the report from Toledo, but say that the removal of the plant to the Ohio city has not been definitely decided as yet.

C. A. Neracher, formerly chief engineer for the Willys-Overland Co., is one of the principal organizers of the Carl Electric Vehicle Co.

NEW MONEY FOR PREMIER

Indianapolis, Ind., Nov. 17—At a meeting of the interests comprising the Premier Motor Mfg. Co., in Indianapolis last Saturday, negotiations were completed that have brought to this concern increased capital in the sum of \$500,000, thus making available means for handling the increased business of the company, which commenced the manufacture of motor cars 10 years ago. With the introduction last year of the Premier little six the business of the company is said to have doubled, hence the demand for increased capital.

DEATH OF STEPHEN BULL

Racine, Wis., Nov. 15—Stephen Bull, last survivor of the "Big Four" who founded the vast J. I. Case T. M. Co.'s interests at Racine, died at Racine on Saturday, November 15, after a short illness. Death was due to the infirmities of old age, Mr. Bull having celebrated his ninety-first birthday on March 14, 1913.

Motoring

"Now comes the winter of discontent," penned a for-all-time poet who was face to face with a perplexing fuel problem long before the motor car was invented. The poet was overly pessimistic, however. No doubt, had he lived in the horseless age, he would have put his car in cold storage early in October and robbed himself of the delights of touring over crunching snow and under dazzling canopies of crystal-laden boughs. The ardent motorist knows no winter of discontent. He pours anti-freeze in his radiator, fastens the side curtains securely, purchases coat, gloves and cap that are the very epitome of comfort, and heeds the call of the frozen road. Provided the motorist equips himself for the winter ride by buying a coat which insures warmth without weight, he can laugh at old Medicine Hat and tour with as much comfort and joy in December as in May. The day is past when Boreas is a bogey man of the motorist.



Coats for Au Revoir Tours of 1913

Motor coat for town wear of rose colored duvlyn, three-quarter length with slash in back. This coat has a kimono sleeve extending from the shoulder into an unusually wide cuff edged with velvet. Large slash pockets and a roll storm collar of velvet are distinctive features. The lining is of rose colored silk. The coat is from Mandel Bros., Chicago, and listed at \$50.



Double-breasted motor coat of English Shetland with detachable lining of either chamois or fur, which fastens to the shell of the coat with buttons and button-holes. This coat is featured by a convertible storm collar, loose belted back, commodious sleeves and large patch pockets. This coat is shown by The Hub, Chicago, and sells for \$65.

London motoring coat of Donegal homespun with large back, narrow English shoulders, close-fitting collar and patch pockets. This coat is shown by The Hub, Chicago, and sells for \$25.



Wheel coat of Donegal homespun with an extremely wide sweep to the skirt of 115 inches. This garment has a raglan shoulder, military collar and slash pockets. The yoke and sleeves are satin-lined. It is from The Hub, Chicago, and listed at \$30.



Town motoring coat of imported green cheviot with lining of squirrel and near-seal collar. The sleeves are large and set-in with deep cuffs. This coat is listed at \$50.

Short motoring coat of double-faced blanket cloth, with Scotch plaid lining. This model is trimmed with fringe of self material, fastens on the side and has a draped side pocket and roll collar. It is listed at \$20 and comes from Mandel Bros., Chicago.

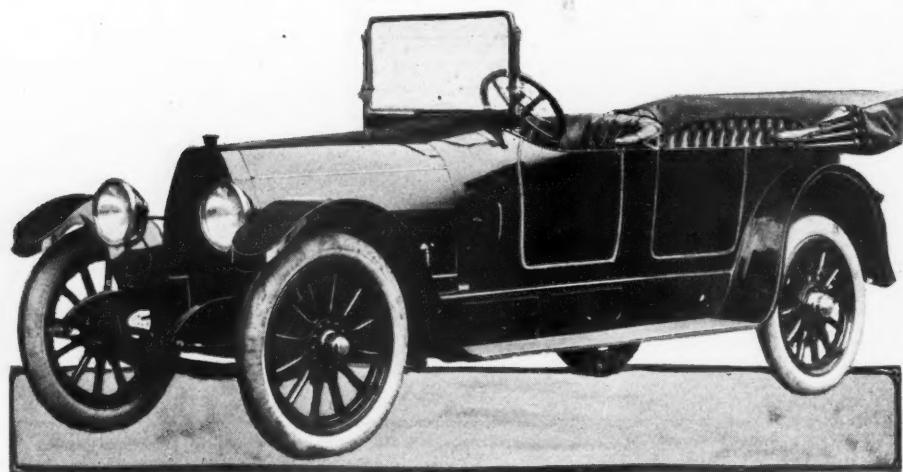


Double-breasted norfolk motoring coat of mackinaw cloth. A shawl collar, large patch pockets with flaps and sleeves with large tabs which button over are features of this garment which is one of the most popular models shown at The Hub, Chicago, and sells for \$12.50.



Vaughan Offers New Design of Six-Cylinder Model

There Are
Five Body
Styles for
1914 Market



THE NEW VAUGHAN SIX-CYLINDER CAR IN TOURING FORM
Notice the unbroken lines from radiator to rear, the absence of dash lights and low cowl

THE Vaughan Car Co. Inc., Kingston, N. Y., has entered the 1914 market with a new design of six-cylinder car which in addition to many refinements in modern chassis design and construction carries a line of five body styles which are replete in the up-to-date niceties of body design, the touring car, the roadster, the four-passenger type, the limousine and the convertible inside drive type all exhibiting features that are characteristic of the latest in body lines and fixtures. This company has mapped out a strong campaign for the coming season, has tested its new line on the roads for many months and has its manufacturing plants well under way.

The new Vaughan car is a good example of the latest in block cylinder design and carries a complete electric cranking and lighting equipment. Power transmission is through a multiple-disk clutch, a four-speed gearset with direct drive on third, with fourth speed geared higher than direct; double-jointed propeller shaft drive, together with an improved system of rear spring suspension. The steering wheel is on the left, the cowl board carries all of the indicating instruments, the car equipment is complete and all bodies are fitted on the same 138-inch wheelbase. The touring car model lists at \$2,750.

Smooth Body Lines

Although the Vaughan chassis carries many characteristics the bodies, too, give the car an air of distinction, the clean-cut streamline effect running unbroken from the radiator to the back. The radiator, narrow and high, has given the designer free scope to carry his streamline past the cowl without a break and give a body of exceptional roominess and yet provide a racy appearance.

The body work exemplifies the streamline trend carried out in every particular, there not being a break in the contour. From the radiator the lines are straight

FEATURES OF NEW VAUGHAN

Single chassis with six-cylinder block motor.

Bore and stroke, 3 3/4 by 5 1/4 inches.

Wheelbase, 138 inches.

Price, \$2,750 as touring car.

Bodies: roadster, touring, limousine and convertible inside-drive type.

Clock in center of steering wheel.

to the end of the bonnet, gradually sloping into the cowl with a slight upward curve, which blends with the downward sweep, that leads to the straight line along the top of the doors and side of the body to the rear. Here the line again curves, without a break, forming the back of the tonneau.

Niceties of Design

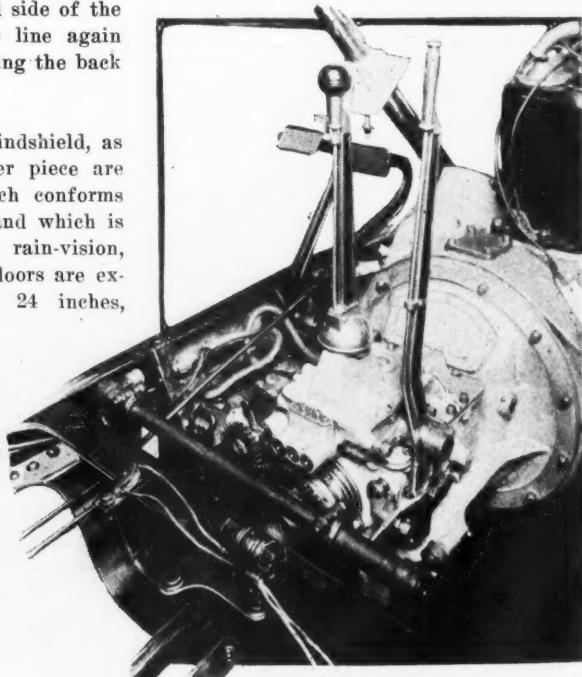
There is no break at the windshield, as the windshield base and filler piece are a single bronze casting, which conforms to the contour of the dash, and which is designed to accommodate a rain-vision, ventilating windshield. The doors are exceptionally wide, measuring 24 inches, while additional space is gained at the rear by allowing the body to extend as far over the whole as possible, this giving the rear seat a width of 43 inches. The upholstery is 9 inches deep.

The chassis, embodying a unit power plant, supported at three points, uses a six-cylinder L-type block motor with cylinders 3.75 by 5.5 inches. These dimensions give an S. A. E. rating of 33.75 horsepower, and on the block the motor

shows 50 horsepower of 1,500 r. p. m. As is usual with cars having the steering wheel on the left, the valve side of the motor is placed on the right, one cam-shaft driven by helical gears serving for both sets of valves. Both manifolds are carried high enough on the right to permit the removal of the valve cover plates and not to interfere with valve spring adjustment. The Rayfield model D carburetor is carried on this side and suspended direct from the intake manifold, a two-bolt flange serving as the attachment.

Gasoline Pressure-Fed

The gasoline system is a pressure-fed. The tank, which is swung on the rear of the chassis in steel straps hung from an extension of the frame, has a capacity of



MOUNTING OF GEARSET AS PART OF UNIT PLANT
Cane-type gearshift lever without quadrant and mounting of speedometer drive are shown

22 gallons. The tank is supplied with a 3-gallon reserve feature and the pressure for the feed is given by a Hancock air pump which is built into the motor. The intake manifold is held in place by dogs and studs, the same dogs also holding the exhaust manifold.

Gasoline is fed at 2.5 pounds pressure per square inch, and for starting this pressure is supplied by a hand pump. The engine air pump is powerful enough to take care of normal leakage, and under ordinary circumstances pumps the excess air through an escape valve.

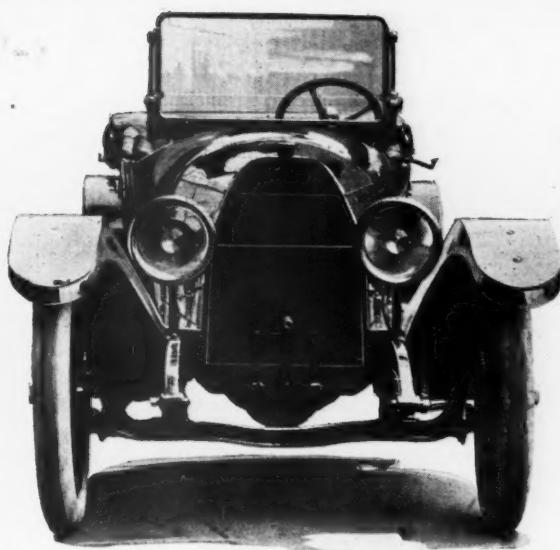
The electric equipment of the car consists of a Mea magneto and a Bijur electric lighting and starting system. For ignition the magneto alone is relied upon, as the electric cranking motor turns over the engine at a speed of 115 revolutions per minute. This is sufficiently fast to furnish proper ignition from the magneto. The amperage drawn in spinning the motor is 122, the cranking motor acting at 6 volts. A feature of the cranking motor is the method of engagement and disengagement with the gear on the flywheel. When the starting motor is put in motion by the depressing of the foot switch a gear which carries on its lower part a pendulum, which holds it in a fixed position, travels along a worm on the shaft until it comes in mesh with the flywheel gear. Then it starts spinning the motor, and as soon as the motor picks up the action of the worm carries the gear again out of mesh.

Features of Electric System

The storage battery used in connection with the cranking and lighting system is a 100-ampere hour Willard. It is charged when the motor speed is above 225 revolutions per minute. The Bijur generator is of the constant voltage and varying ampere type and starts charging at a 20-ampere rate. A bucking coil in the winding prevents an excessive charging rate of high speed. It is a 6-volt machine, as is the entire system.

A feature of the entire electric installation is the short wiring. For the lighting system the single-wire method is used and for the starting system the double-wire system. In the wiring arrangement all the body wires are carried entirely on the body and all the chassis wires entirely on the chassis. Connections are made in a junction box located on the dash. This box is so arranged that each terminal is of different size, thereby avoiding any chance of confusing the wiring. To remove the body from the chassis it is not necessary to break any connections except at the junction box. All wiring is carried in flexible conduits.

The oiling system of the motor is a combination force-feed and splash. A self-contained positive-feed pump carries the oil from the reservoir in the lower por-



FRONT VIEW OF THE NEW VAUGHAN CAR
Showing the narrow, high radiator and the streamline
of this body

tion of the crankcase to the main bearing of the crankshaft, thereby furnishing these bearings with positive force lubrication. The excess oil drains from these bearings to pockets in the bottom of the crankcase so arranged that the connecting-rods dip into them at each revolution, the spray connecting-rods serving to lubricate the cylinders, camshaft and connecting-rods and to keep the entire interior of the motor filled with oil spray.

The excess oil above the level of the splash pockets flows through holes back to the reservoir. An indicator showing the level of the oil in the reservoir is placed close to the combination breather and filler tube.

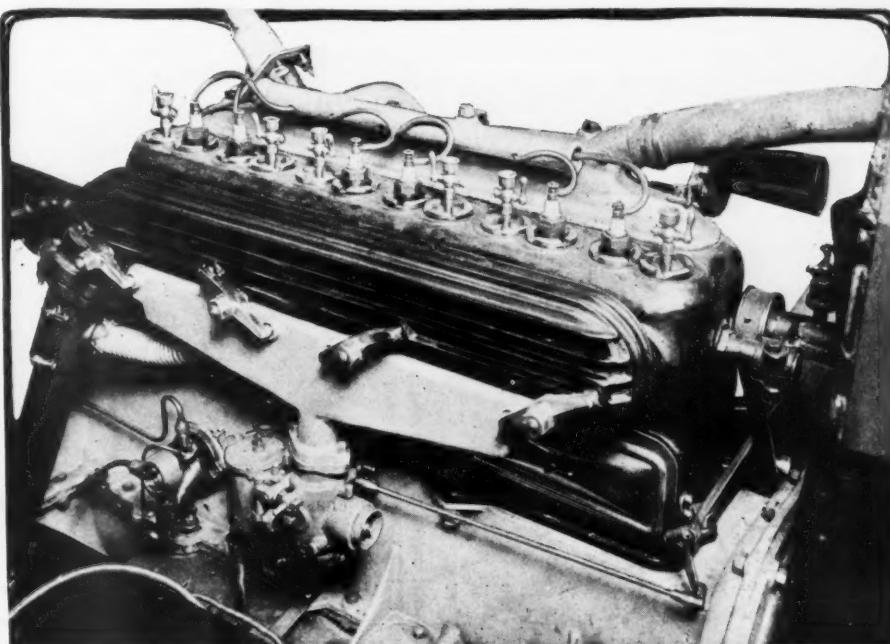
The cooling system of the car has been given unusual attention. At first sight it would appear that the narrow radiator had

cut the cooling space. A closer inspection, however, will show that the area is in excess of the natural motor requirement, as the radiator has a surface of 416 square inches and a thickness of 4 inches. Figuring on the average requirement of 10 square inches of radiator to a horsepower, the radiator is capable of taking care of a steady output of 41.6 horsepower.

In addition to the large radiating surface, special provisions have been made to take care of the air which passes through the radiator. The swirl from the fan blades is thrown through three louvres in each side of the bonnet and the straight flow is sucked back through a series of louvres in the bottom pan, thereby obviating all possibility of carrying any dead air under the bonnet. A still further provision for removing the air as fast as it is carried through the radiator is the placing of a screen of gauze between the dropped portion of the frame and the sill. These provisions in connection with an efficient four-blade pressed steel fan operating at three times crankshaft speed give a highly adequate cooling service.

Four-Speed Gearset

The clutch is of multiple-disk type. It carries nineteen plates, nine of which are faced with Raybestos and ten with steel. The clutch is the dry type and is in unit with the motor and gearbox, the crankcase being extended back to inclose the flywheel, and also to house the gearbox. The gearbox is the four-speed type geared above direct on fourth, furnishing a ratio of 3.04 to 1 between the motor and rear wheels, and on direct or third a gear ratio of 3.8 to 1. The gearbox is carried on the frame and forms the rear supporting



COMPACT SIX-CYLINDER MOTOR OF NEW VAUGHAN CAR
The carburetor is connected by a very short pipe to the large manifold which, together with the exhaust leader, is held by dogs

member of the unit power plant. The gears in the gearbox is 3.5 per cent nickel steel and the nickel steel shafts are splined.

The gearshifter lever is a rocking type and does not work in the customary H-quadrant. The movements of the shift gears, however, are very similar to those of the H-type, with the exception that, instead of moving the entire lever, it is rocked about a fulcrum and then moved either forward or backward to secure the different gear changes. The gearshifter lever is in the center of the car and is mounted directly on the gearbox cover, the casting being so shaped as to provide for the lever. The speedometer drive also is mounted on the gearbox, as is shown in the illustration at the bottom of page 22. The gear wheel which furnishes the drive to the speedometer gear is mounted on the shaft just behind the gearbox and before the cross frame member which supports the Spicer universal joint.

Power Transmission

The drive is taken through a carbon steel shaft, with a universal joint at each end. This shaft is practically horizontal when the car is loaded, giving a straight-line drive from the motor to the rear axle. The rear axle is the floating type with a pressed steel housing. The shafts are carried on bearings of annular ball type and are composed of nickel chrome steel. The drive is taken through a heat-treated pinion gear and ring gear of 3.5 per cent nickel steel. The bearing housings for both the pinion and ring gears are integral with each other, thus preventing any possibility of a change in alignment, and giving a construction which permits of the gears to be removed from the axle housing to permit of adjustments being made on the bench.

The front axle is the Lemoine type, dropped-forged, and has an I-beam section. The bearings are of annular type and are designed to afford a large factor of safety on radial load. To take care of the end loads due to steering and road shocks, thrust bearings are fitted, which relieve the ball bearings of any duties in this

direction. The steering gear is chiefly noteworthy for the fact that at every point where wear can result from use this wear is taken on eccentric bushings. Lost motion at any point can be taken up and replacements of large parts through wear are avoided. The worm has a triple thread of large diameter and is made of hardened nickel chrome steel. It is fitted with ball-thrust washers at the top and bottom and meshes with a complete gear. The cross shaft is of carbon steel, heat-treated and ground.

Floating Cantilever Springs

The drive from the wheels is taken through a torque member, while the lower members of the rear springs act as radius rods or distance pieces. The torque member is of pressed steel and is fixed to the rear axle housing and supported at the front end by a large ball-and-spring socket. The rear springs which are worthy of attention is that the upper member, does as much work as the lower, are of the floating cantilever type, which, briefly described, resemble a three-quarter elliptic spring, except that at the point where the upper member naturally would join the frame it is carried on through, and at this point a bearing is inserted with spring clips, and at the forward end the spring is shackled. The rear spring shackle is so arranged that it is impossible for it to turn over through a severe jounce. The rear spring is 52 inches long and the front spring is 40 inches long.

The wheels are of hickory and are of the artillery type. There are ten spokes in the front wheels and twelve in the rear. All spokes are of 1.75 inches in width and wheels are fitted to carry 35 by 4 inch demountable rims. Wire wheels are supplied with this car if desired at an extra cost of \$250. Both sets of brakes are on the rear wheels, the service brakes have a drum diameter of 15 inches and a face width of 2 inches. The brake rods are made of $\frac{3}{4}$ -inch steel tubing with electrically welded yoke ends. The brake adjustments can be made by removing one of the foot boards, which renders the brake adjustment features accessible. The

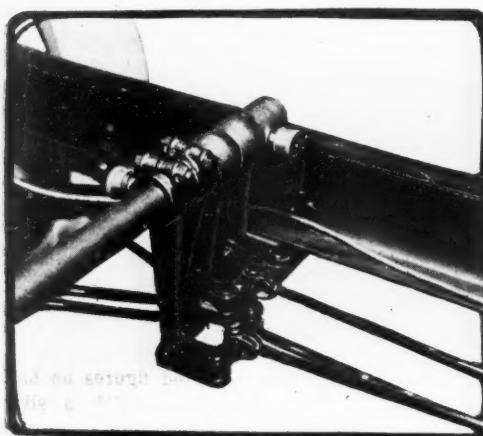
emergency brake lever is mounted in the center of the car to the right of the gearshift lever.

The control system is standard throughout. The steering wheel is mounted on the left side and the dash instruments are on a cowl board before the eyes of the driver. On the end of the steering column and mounted with it as a unit is a Waltham clock. The carburetor adjustment device, Bijur generator indicator, magneto switch, etc., are all arranged within easy reach.

The frame is of channel section of carbon steel. It is tapered at both ends, giving uniformity of strength and at the same time reducing the total chassis weight, which amounts to about 2,800 pounds. The depth of the frame channel is 6 inches, giving a perfectly rigid structure throughout the entire length. The frame is dropped and the clearance of the car is 9.75 inches. The floorboards of the touring body are 26 inches above the ground.

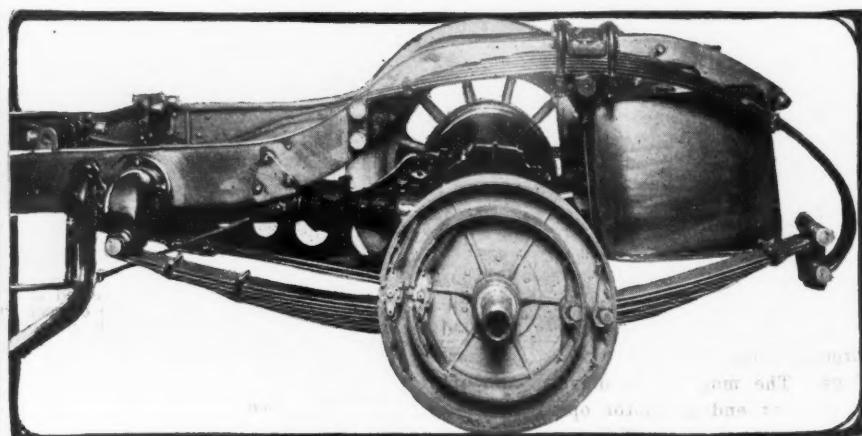
MOTOR PLANT SOLD BY RECEIVER

Milwaukee, Wis., Nov. 18—The plant and equipment of the Milwaukee Motor Co., bankrupt, was bid in for \$86,000 by the Chicago House Wrecking Co., Chicago, at receiver's sale today. The assets were divided into three parcels, the first consisting of the plant site at Thirty-second and Burleigh streets, Milwaukee, together with buildings, machinery, equipment, stocks, etc., which brought \$86,000 from the Chicago concern; the second, consisting of 163 acres of woodland in Taylor county, Wis., which was bid in for \$800 by John D. Boes; and the third, consisting of accounts receivable, which was withheld from sale because of the tangled condition of the accounts. It is expected that the court will approve the bids for both of the parcels offered today, according to Oliver C. Barth, of the First Savings and Trust Co., receiver. Mr. Harris, who represented the Chicago House Wrecking Co. at the sale, said he was not prepared to say what disposition the company intended to make of the purchase.



BRAKE CONNECTIONS AND TORQUE ARM

Unique design of torque yoke; also thorough supply of grease cups on brake shaft



REAR END OF VAUGHAN CHASSIS

Peculiar construction of floating cantilever spring and interior of brake drum on the 1914 Vaughan

Agents Inspect the New Lozier Four

Seven-Passenger and Roadster Models

DETROIT, Mich., Nov. 18—At the convention of Lozier dealers held at the Detroit offices of the Lozier company, Monday and Tuesday of this week, official announcement was made of the new \$2,100 four, which will be brought out at once. The two Lozier factories at Detroit and Plattsburg will immediately begin production work of the new cars.

The new four will be manufactured in two models only for the present—a seven-passenger touring car and a roadster model. The car has a wheelbase of 120 inches with a tread of 56 inches. The seven-passenger model can be converted into a five-passenger car, by the disappearing seats in the tonneau which fold into the back of the front seat.

With a bore of $4\frac{1}{4}$ inches and stroke of $6\frac{1}{2}$ inches, the four motor is one of the most powerful and efficient power plants ever installed in a Lozier car. It is entirely of Lozier design and built in Lozier factories. The car is said to have shown over 56 horsepower on brake test. In introducing the car to dealers, Sales Manager Paul Smith made the statement that the Lozier four marks the first time any manufacturer has combined long-stroke pulling qualities with absolute absence of vibration at high speeds. The motor has been run from 100 to 2,100 revolutions per minute without noticeable vibration at any speed, it is asserted.

First glance at the power plant of the new car gives the impression that not a single working part is exposed to view. The four cylinders cast in block have given Lozier engineers the opportunity to make the car practically fool proof. The left side of the motor is unbroken in appearance save for the carburetor, which is placed in a position for easy access. The L-head cylinders allow the placing of all parts on the right side, the waterjacket and upper half of the crankcase being cast integral. The cylinder head of one piece is easily removed by turning several nuts, and valves can be ground or carbon removed from combustion chambers without taking the motor apart. The cylinder head is fitted with spark plugs, pressure relief, priming cock, water return tubes and wire tubes—all these are removed from the cylinder block in unit with the head. A copper asbestos gasket is used between the cylinder block and the head. Valves are made of solid tungsten steel.

Ignition is furnished by a Bosch high-tension magneto, all wires being carried through tubes to their respective spark plugs. The magneto is driven by shaft from front end of motor operated by a silent chain. A very efficient cooling system is effected by use of a centrifugal pump, driven by the same shaft operating the magneto. The radiator is of the square

tube type and an 18-inch fan driven by leather belt completes the system. Lubrication is by pressure feed. The clutch is of the multiple-disk type, housed in the engine flywheel and running in oil. Four forward speeds, a transmission feature that was used on the former big four and big six models turned out by the Lozier company, is incorporated in the new four. Direct drive is on third speed. The transmission is arranged as a unit with the motor. The Gray & Davis lighting and starting system is used.

A round pressed steel tank of 20 gallons capacity is suspended in the rear. Four brakes are used, two on each wheel. Left side drive and center control are standard on the four as on all Lozier

models of the past 2 years. The control lever in center is of the ball type, a simple and easily operated form.

The running boards are clear of all obstructions, the patent tire carrier at the rear taking care of the tires, and a compartment arranged on the engine base at the left of the motor for tools. The Lozier patent tire carrier is used for carrying extra tires of the 36 by $4\frac{1}{2}$ size which are standard on the car. By simply pressing down a hand-lever, the extra tire is kept firmly in place. A one-hand operated wind-shield is furnished as standard equipment. An automatic tire pump which can be thrown into operation at once, electric head-light dimmers and convex rounded fenders are also among the features of construction noted in the latest Lozier product. All instruments, such as speedometer, dash gauges, ammeter, etc., are located on instrument board under the cowl, in easy reach of the driver's hands.

Discuss Lighting, Starting and Ignition

Electric Engineers Listen to Papers

NEW YORK, Nov. 18—Three papers dealing with the electric lighting, starting and ignition of motor cars were read at a meeting of the American Institute of Electrical Engineers last night. These were "Dynamo Electric Lighting for Motor Cars" by Alfred Waller; "Advantages of Clutch Type Generator and Separate Starting and Lighting Units for Motor Cars," by Alexander Churchward, and "Electrical Equipment of Gasoline Automobiles," by Frank Conrad. The meeting was presided over by President Mailloux with John H. Hippel in the chair.

Abstracts of the three papers follow:

Dynamo Electric Lighting for Motor Cars—The design of motor car lighting apparatus begins with the choice of a satisfactory lamp equipment. This fixes the quantity of energy which the lighting system must supply at any time, and indicates the dynamo capacity to be provided.

The dynamo must be geared to give its full output at the average speed reached when driving with all lights on, in order that the battery reserve may be drawn upon only when the car is not in motion.

When a battery auxiliary is used it must be connected to the dynamo when conditions are right for charging, and disconnected when the engine is at rest, to prevent discharge through the dynamo. Safety and convenience require that this action should be automatic, also that the output of the dynamo should be limited to a predetermined and safe maximum, regardless of dynamo speed. This leads to a discussion of methods devised to secure automatic control, and to the speed rating of the dynamo itself. This is limited on one hand by the weight, size and cost of slow-speed dynamos, and on the other, by consideration of wear on bearings, commutator and driving means of the high-speed type.

Advantages of Clutch-Type Generator and Separate Starting and Lighting Units—A constant-speed dynamo for motor car lighting and for battery charging is to be preferred to other designs chiefly because it has the correct characteristics for its assigned work, because its efficiency is high while the wear is small, and because it is able to maintain a potential at the lamps so constant that it will even carry the lamps with the battery disconnected without injuring them.

The generator and starting motor should be built as separate electric units because of the lighter, smaller, less complicated battery required, because of the greater reliability of the separate units, and because of the characteristics of the starting motor—necessarily series-wound—are directly opposite to those of the

generator, which is of necessity either shunt or compound-wound.

Electrical Equipment of Gasoline Motor Cars—The relative merits of various ignition devices are discussed and the use is advocated of an induction coil operating from a constant-potential circuit in connection with a device which will limit the current at low speeds and still permit sufficient current flow at the higher speeds. A variable-contact device is used to operate the coil at its most efficient point and this eliminates to a considerable extent the necessity of manual control of the firing point. This ignition system produces a spark no matter how slowly the engine is turned over, thus lending itself particularly to electric motor starting.

A lighting generator should be capable of supplying equivalent to the average lamp load, when the car is running at a speed of 15 miles per hour. The method of regulation advocated is a demagnetizing series coil in the battery circuit, thus maintaining constant charging current. The lighting circuit is so connected that the current to the lamps will not pass through the series coil, thus tending to maintain a constant charging current independent of the lamp load.

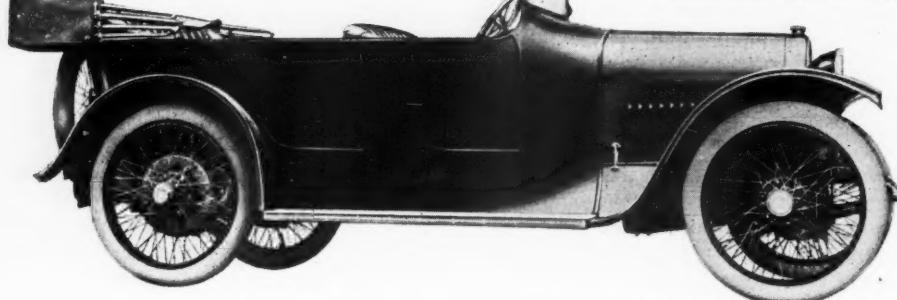
For starting purposes two schemes are possible, namely, the use of the lighting generator as a motor, or the use of a separate motor. The separate starting motor is advocated and its characteristics are discussed.

Much interesting discussion followed the reading of the papers. H. Ward Leonard was one of the principal speakers but his remarks were less in the nature of discussion than an exposition, based on his experience of the desirable features of the perfect electrical equipment for the motor car. He said that after considering all details of systems in general it would be found the crux of the whole problem was the means of regulating the generator automatically. The importance of this detail could not be exaggerated.

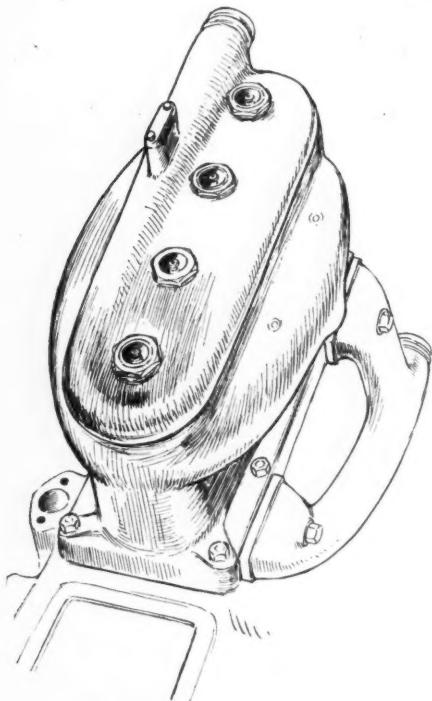
The discussion proper was directed largely to Mr. Churchward's paper on the slipping clutch generator. Leonard Kebler, in giving his opinion on this form of generator regulator, stated figures he had obtained from tests made with a slipping clutch drive in comparison with one in which current regulation was effected by electrical control of the field strength through the use of a vibrator regulator.

Moline-Knight Characterized by Unusual Motor Details

Sleeve-Valve Engine in Single Chassis of Concern Is First Block Casting of This Type in America



NEW MOLINE-KNIGHT STREAMLINE BODY OF EUROPEAN CAST
Unbroken line from radiator to rear; tops of seats barely visible above sides of body; wire wheels are extra



BIRD'S-EYE VIEW OF MOLINE MOTOR
The smooth oval outline of the cylinder castings is apparent; notice also the location of the spark plug within the water header and the branched lower water manifold

ONE of the most interesting of the season's announcements is that of the Moline Automobile Co. that in the future its products will be Knight engined. Incidentally the price at which the single model is to be marketed, \$2,400, is lower than that of any other car so far produced with the sleeve-valve motor. Aside from the new power unit there is very slight change in the chassis from that which has made such an enviable record for the Moline in reliability runs of previous years.

The new engine is manufactured in the Moline factory under license from Charles Y. Knight, but it differs very radically in many respects from former Knight designs as developed in any other American Knight-engined cars and also departs in some respects from any previous Knight practice

FEATURES OF MOLINE
Sleeve-valve engine 4 by 6 inches cylinder dimensions, 50 horsepower guaranteed
One model only, a combination five- or seven-passenger body, with 128-inch wheelbase and 36 by 4½-inch tires
Lowest-priced Knight, \$2,400
Only Knight with thermosyphon cooling
Only Knight in America with cylinders cast in block

on either side of the water. That the Moline company contemplates continuing this type of motor for some time is evidenced by the complete line of special jigs, dies and machine tools for quantity production which becomes apparent upon an inspection trip through the plant.

Coincident with this change in the Moline power plant, a new nameplate appears and the familiar Dreadnought is discarded. The central idea is a medallion of Sir Galahad, the most nearly perfect of King Arthur's Knights of the Round Table, to symbolize the Moline force's faith that the car is the most nearly perfect of the twentieth century Knights. On either side are the words "Moline" and "Knight." The colors are blue and gold, as were the colors of the original Knights of the Round Table.

The Moline-Knight appears only as a touring car, seating five and ironed for two extra seats to make it seven-passenger capacity. The wheelbase is 128 inches, tires 36 by 4½ inches; drive to left and control center. The Knight engine carries the guarantee of the Moline company that it will develop 50 horsepower.

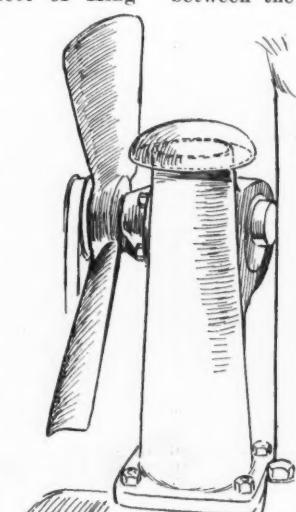
The motor dimensions are smaller than would be expected in view of the guaranteed power output. The cylinder bore is 4 inches and the piston stroke is 6 inches in length, ½-inch less bore, but the same stroke as that of the present poppet type which the Knight displaces. The 4-inch bore gives the new engine an S. A. E. rating of but 25.6 horsepower. Yet on brake tests at the Moline factory the motor has shown 65 horsepower at 1,800 r. p. m., at which point the tests were stopped on account of the limitations of the dynamometer, although no indications were observable that the maximum power point was being approached. This power is to be expected in view of Knight performances in Europe, for instance the Lauraine-Clement car of slightly smaller dimensions than the new Moline, 3½ by 5½ inches, has developed 74 horsepower at 2,220 r. p. m. under test.

Unusual Features of Engine

The engine presents a number of unusual features of design. The chief of these is that the block casting—the only block-cast Knight in America—has the intake and exhaust manifold integral with the cylinder block and both manifolds, as well as the entire length of the cylinder barrel, are completely surrounded with an exceptionally capacious water jacket. The cooling system presents the most numerous individual features of design, and especial effort seems to have been made to assure adequate cooling. In the Moline, the cylinder heads are covered by a removable plate over the four cylinders which leaves between the cover and the cylinder head

an unusually ample water space.

Also, the cylinder head is a cone-shaped cap with the spark plug in its center and which sets into the cylinder to a depth of several inches. The space between the center and sides of the cap are in the water circuit so that the upper ends of the two reciprocating sleeves have water circulation on both sides of them and the upper half of the spherical combustion chamber is surrounded by a waterjacket. This arrangement is well illustrated in the sectional diagram of the motor on these pages. It will be seen that the reciprocating sleeves throughout their entire length, except at the ports



BREATHER AND FAN STAND-ARD

The fan is mounted in an eccentric bearing upon the combination breather pipe and oil filler

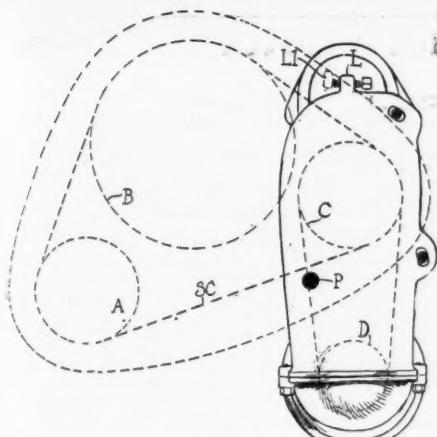


FIG. 1—CHAIN TIMING DRIVE ADJUSTMENT

This is provided by swinging magneto pulley C about pivot P

and at their extreme lower ends, are surrounded by water.

Circulation of the cooling water is by thermosyphon, the only instance of Knight construction in which a pump is not used. The cylinder cover plate forms the upper water manifold through which water passes to the radiator. The lower connection from the radiator has two branches, one leading to the forward end and the other to the rear end of the lower edge of the cylinder block. By this means, an equal flow of water is assured to each cylinder, the cooling fluid passing upward along the cylinder barrel then around intake and exhaust manifold, thence to the cylinder head and then through the water outlet.

Novel Cooling Design

As might be expected with thermosyphon circulation and an unusual volume of waterjackets about the cylinders the water headers are exceptionally large in diameter. The nuts which hold the cylinder cones upon the casting are of bronze. This is necessary to prevent their sticking, as they are always in the path of the circulation of water. It will be noticed from

the cross-sectional view that the spark plugs are disposed in little wells which extend through the waterjacket.

The concave top of the piston and the conical cylinder cap give a quasi-spherical combustion chamber which approaches very nearly to that generally considered as ideal.

Sleeves are operated by connecting rods from the eccentric shaft, which is driven by silent chain from the crankshaft. The chain also passes over the sprocket which drives the magneto and the electric generator, the former being mounted on top and the latter on the bottom of a base plate on the left side of the motor. The magneto sprocket is made to serve as the chain drive adjustment in a very ingenious way. This is illustrated in Fig. 1 in which A is the crankshaft sprocket, B the eccentric sprocket and C the magneto sprocket. The combined magneto and generator base is carried on a long pin P which acts as a pivot, allowing the magneto and generator to swing about it as a center. As the sprocket C is on the magneto shaft, the latter may be moved in or out around P as a center and the slack in the chain thus be taken up.

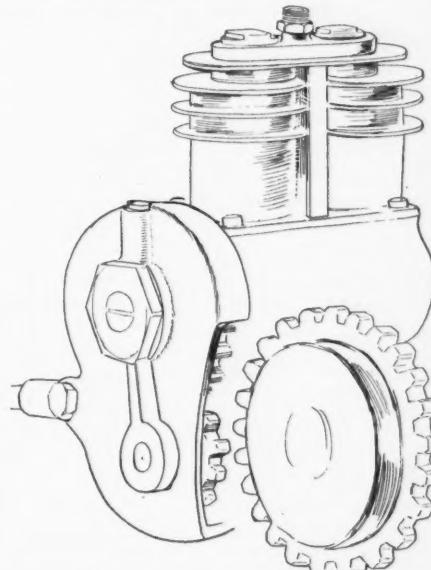
Hollow Connecting Rods

An inspection of Fig. 2 will show that connecting rods are hollow; in fact, these are true tubular sections having a $\frac{1}{8}$ -inch hole in them which performs an important function in the lubricating system. Oil is forced at a pressure varying from 0 to 40 pounds through drilled crankshafts and hollow connecting rods to every bearing in the motor. The circulation and pressure is maintained by a gear pump which takes oil from a sump in the bottom of the crankcase through a screen, forces it through a manifold M, which runs along the crankshaft bearing plate the entire length of the motor and parallel with the crankshaft. At the three main bearings leads L conduct the oil to the crankshaft bearings.

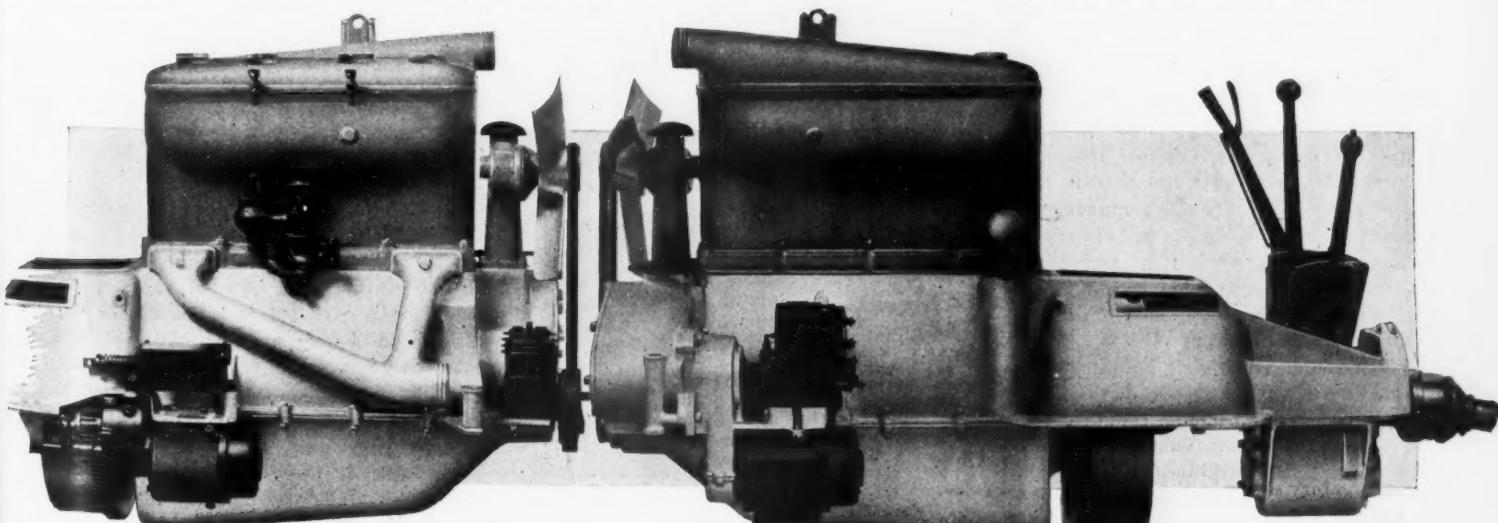
There are no oil slots in any of the bearings, all bearings of the motor being floated on a film of oil, a system coming into vogue in Europe. At the main bearings, holes drilled in the crankshaft lead the oil to the connecting rod bearings which are floated in the same way. Here the drilled hole in the crankshaft registers once every revolution with a hole in upward portion of the connecting rod bearings which communicates with the hollow connecting rod. The connecting rod is full of oil which is released in the same way to the piston wrist pin. The latter is not locked in place in the piston in any way, but is a tube riding freely in the piston and retained only by the lower half of the lowest one of the three piston rings.

Oil Pressure 40 Pounds

There is a lead to the idler of the chain drive and this carries oil to the magneto shaft bearing. The maximum oil pressure is 40 pounds to the square inch, but this is



DETAIL OF TWO-CYLINDER TIRE PUMP
The gear at the right is on the forward end of the crankshaft and the lower of the two on the pump is swung into mesh with it



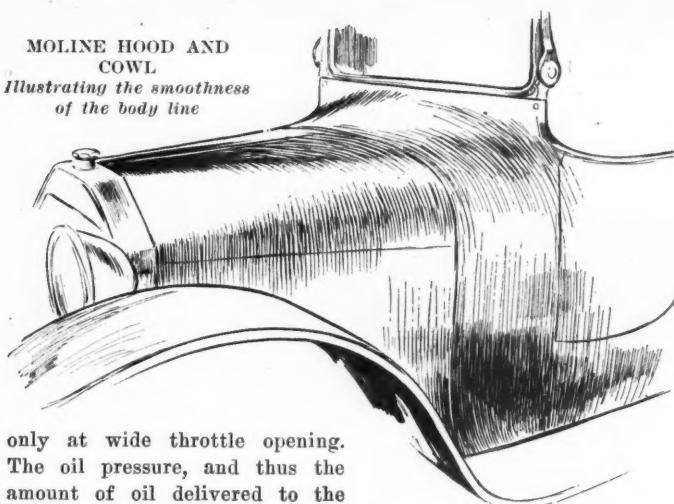
CARBURETER SIDE OF THE MOLINE-KNIGHT MOTOR

This shows how carburetor is bolted directly to cylinder casting; also cranking motor and driving gear to flywheel, as well as location of power pump

EXHAUST SIDE OF MOLINE-KNIGHT UNIT POWER PLANT

The third lever of the three shown at the right operates the starting motor and takes the place of the conventional foot button; at the forward end of the motor is the magneto mounted above, and the electric generator below a common base

MOLINE HOOD AND COWL
Illustrating the smoothness of the body line



only at wide throttle opening. The oil pressure, and thus the amount of oil delivered to the bearings is regulated by the throttle opening, so that the lubrication control is automatic. The pressure regulation is obtained by means of a three-way cock connected with the throttle and through which the oil is forced just after it leaves the pump. The openings at the top are graduated so that with the throttle closed the cock is discharging the oil directly into the sump and allowing almost none to enter the leads to the bearings. However, as the throttle is opened wider, less oil is discharged directly into the sump and more is permitted to pass to the bearings, until with wide open throttle the entire output of the oil pump goes to the bearings.

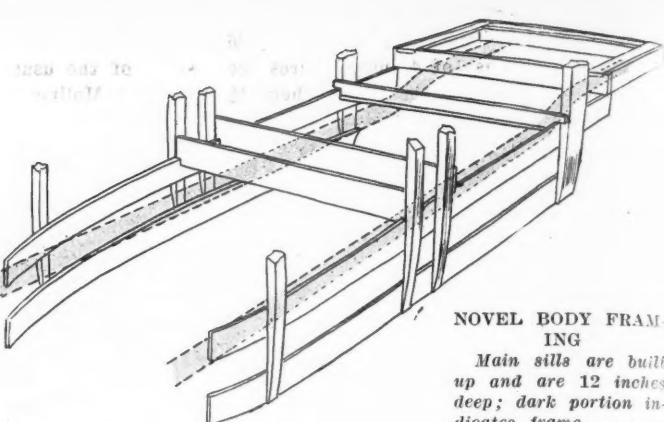
Unique Fan Standard

A novelty in fan standards is that on the Moline Knight, in which the combination breather pipe and oil filler also serves as the base for the fan bracket as shown in one of the sketches. The latter is driven by a belt from a small pulley on the end of the crankshaft.

As a part of the motor construction is the two-cylinder air pump for tire inflation carried at the forward end of the motor and driven by gears from the crankshaft. Just behind the fan pulley there is a small spur gear and an idler gear always in mesh with the gear on the pump crankshaft. The idler gear is pivoted so that, by means of a lever which projects to the front of the car under the radiator, it may be swung into mesh with the gear on the engine crankshaft. By this arrangement, the pump is not in operation nor are the gears in mesh except when tires are being inflated and the pump may be put in operation without lifting the hood.

Lighting and Cranking

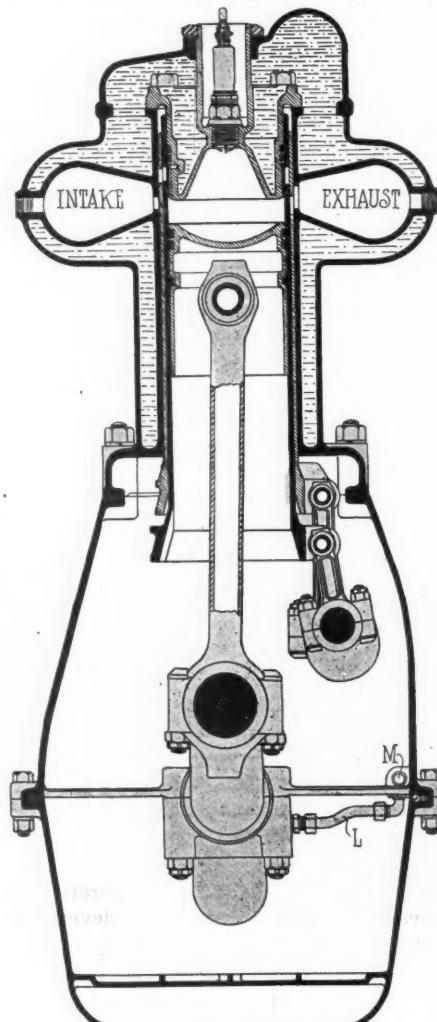
Electric lighting and cranking is provided by a Wagner system of the two unit type designed especially for this engine. The need for special design of electric system brings out strikingly one of the features of the Knight engine. The extreme silence of operation of the Knight engine makes audible numerous little noises that with the poppet type of engine were unnoticeable. Among these hitherto inaudible sounds was a little squeal due to the



NOVEL BODY FRAMING
Main sills are built up and are 12 inches deep; dark portion indicates frame

rubbing of the brushes on the commutator, consequently it was necessary to use a slightly different design of commutator and brushes.

In other little things alterations were found necessary to accommodate the cranking system. As mentioned previously the generator is inverted on the magneto plates and driven by an inclosed silent chain from the magneto shaft. The chain



SECTION THROUGH MOLINE CYLINDER
This shows the complete inclosure of cylinders and manifold in a jacket of water, also the tubular connecting rods

runs in a bath of oil. The cranking motor drives through steel ring gears on the flywheel periphery and cranks the engine at a speed of 120 r. p. m., requiring a current of 220 amperes on the jump, but dropping to 75 amperes as soon as crankshaft rotation is started. The system is a 12-volt one, although a three-wire lighting system is provided whereby 6-volt lamps are used in the ordinary way. The battery is a 12-volt LBA of 80-ampere-hour capacity and is located under the front seat. Instead of the usual pedal for operating the cranking switch and sliding the motor gear into mesh with the flywheel, this function is cared for by a small lever similar to, but slightly shorter than, the gearshift lever and located beside the latter. Bosch ignition and Schebler carburetor are features of the motor equipment.

Knight motors in general are noted for clean exterior appearance, due to the fact chiefly that the valves and valve-operating mechanism are within the cylinder. In the Knight engine as designed by the Moline company this cleanliness of exterior is carried further than ordinarily due to the complete inclosure of the manifolds and the submergence of the spark plugs. The power plant as a whole is a unit, the engine, cone clutch and three-speed gearset are combined and supported at three points, the Moline car being among the first to apply three-point suspension.

Little Change in Chassis

There has been little change in the Moline chassis other than the motor. The former Moline policy of elliptic springs at the rear has been abandoned in favor of the half-elliptic type underslung and shackled at the rear of the frame which is an importation from Europe. The floating rear axle is retained and the wheels are carried on double annular ball bearings with the wheel flange passing to the wheel by eight studs. This type of rear construction permits the removal of the axle shafts without disturbing the wheels and without jacking up the rear end. The differential is carried on roller bearings, a means of adjustment being provided which requires only the loosening of four bolts.

The frame is of pressed steel with a drop over the rear wheels which brings the body slightly nearer the ground than

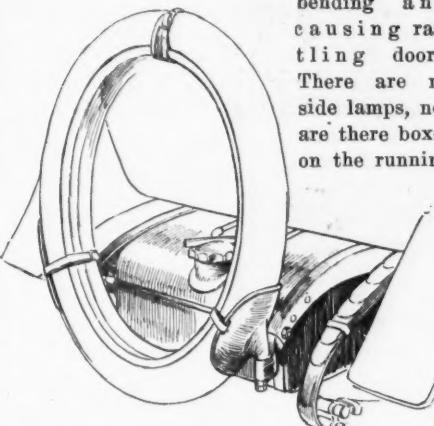
formerly and gives the car a rakish appearance. The wheelbase is now 126 inches, an increase of 4 inches; tires are 36 by 4½ inches, which makes them ½ inch larger in cross section than formerly. The brakes have a drum diameter of 16 inches and are 2½ inches in width. The emergency brakes are expanding shoes with special lining applied to the inside of the drum. The regular service brakes are contracting bands operating on the outside of the drums. There is a change in the location of the fuel tank, this being removed from the cowl to the rear of the frame.

The New Moline Body

Mounted on the Moline-Knight chassis is the streamline body fashioned after European design. It is much roomier, stiffer and yet is lighter than the 1913 Moline superstructure. Standing in front of the new car one can observe a continuous, unbroken curving line extending from the rear of the body to the radiator. The body line is not broken at the dash. The rear part of the hood is flush with the cowl dash so that there is no inset where the hood and body meet and the top of the hood slopes down gracefully toward the radiator. The sides of the body are exceptionally high, being almost flush with the top of the seat backs. The body is roomy enough for seven passengers. All of the five-passenger bodies are ironed for two extra seats.

Special attention has been given to the framing of the body, chiefly to prevent

that sagging and springing in service which means sticking or gaping doors. Instead of the usual main sills, heavy and laid flat Moline stills are a skeleton truss construction 12 inches in depth which eliminates the possibility of the body bending and causing rattling doors. There are no side lamps, nor are there boxes on the running



REAR OF THE NEW MOLINE-KNIGHT

This illustrates the method by which the fuel tank is supported from the rear end of the frame and mounting of the tire holder; semi-elliptic springs are used instead of the three-quarter elliptic shown

board to mar the clean lines of the body, the side lamps being supplanted by a dimming arrangement for the headlights. The tires are carried in a rather unique holder which sets into sockets on the rear end of the frame, the latter also supporting the fuel tank. The fenders are crowned.

As to the performance of the car, the

writer experienced a pleasurable shock upon his first ride. The uncanny quietness of the motor conveys no idea of the power it conceals, and the speed at which it gets away and its spirited response to a throttle opening were quite unlooked for. A little hill some two blocks long on the outskirts of East Moline, with a grade of 9 per cent, according to local surveyors, offered an opportunity to test the hill-climbing abilities of the new car, so with a party of seven, we started up the hill with a rather bad, muddy surface at a speed of 15 miles per hour. Half way up we were running 23 miles an hour and finished at 19, high gear all the way, of course.

A High-Gear Test

President Van Dervoort, of the Moline company, tells of a drive he made in the mud from Delavan, Wis., to Moline, a distance of some 150 miles, with five passengers. The drive was made on high gear all the way without change.

Complete equipment is featured by the Moline company for its new model. This includes mohair top, automatic rain-vision windshield, electric horn, Goodrich tires, gasoline and oil gauge on the dash, dash light, illuminating gauge and speedometer, and 8-day cock, Warner 60-mile speedometer, Firestone demountable rims in addition to the usual outfit of robe and foot rails and repair kit. Five wire wheels are offered at \$75 additional. Two auxiliary seats for which the bodies are ironed are listed at \$60 extra.

Locomobile Concentrates on Six-Cylinder Cars for 1914

Choice of Right and Left Drive Given

LOCOMOBILE has dropped the manufacture of fours and has concentrated on four six-cylinder chassis which offer a choice to suit the tastes of any purchaser desiring a high-class car of this type.

The four chassis naturally divide themselves into pairs as there are two 38 and two 48 models. In each case there is a left drive and a right drive and the models are named accordingly, 38 L D and 38 R D; 48 L D and 48 R D, signifying the rated horsepower of the car and whether or not it is left or right drive.

Gearshift Center and Emergency Left

Beyond dropping the four-cylinder model, the Locomobile line shows but little change over its 1913 line. In putting left drive on the two sixes it has been necessary to make only few changes and these are principally in the line of a different arrangement of attachments due to the new position of the steering gear. On the left drive cars a novel feature is the arrangement of the gearshift and emergency brake levers, the gearshift in the center and the emergency brake to the left. The position of the gearshifter lever is such that it fits tightly against the front

LOCOMOBILE 1914 FEATURES

- Four six-cylinder models*
- Choice of left and right drive*
- Four-cylinders abandoned*
- Improved carbureter design*
- Improved body work*

seat in such a position that while shifting is easy there is no interference in the passage way between the front seats and a single lap robe may be used if desired.

Another feature which the left-drive cars have which will not be found in the right drive, is the pressure fuel system, these cars having the gasoline tank at the rear, are fed by air pressure introduced by a plunger pump driven by an eccentric from the camshaft. The tank pressure is under the control of the operator by means of a pressure-regulating device consisting of a plunger which works against a spring.

The left and right-drive cars weigh practically the same but there are slight differences, due to the greater length of the left-drive car both in the 38 or 48. On the 38 or little six right drive the

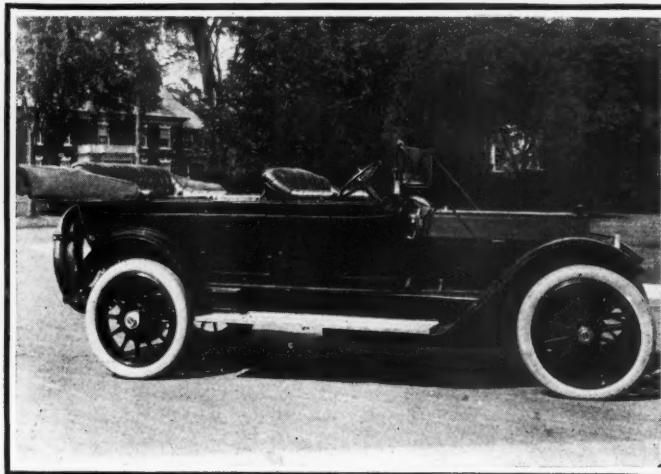
wheelbase is 128 inches, whereas on the left drive the wheelbase is 132 inches. On the big six, right drive, wheelbase is 136 inches and left drive 140 inches.

For 1914 an improved carbureter design is used. The principal improvement is in the needle valve construction governing the fuel level. Mounted on the steering column directly under the steering wheel is an air-controlling device which enables the driver to change the richness of the mixture. By pressing a button on the dash gasoline is drawn directly into the intake manifold allowing an easy start. The Gray & Davis electric motor starter equipment which was first introduced in 1913 is continued this year as a regular feature.

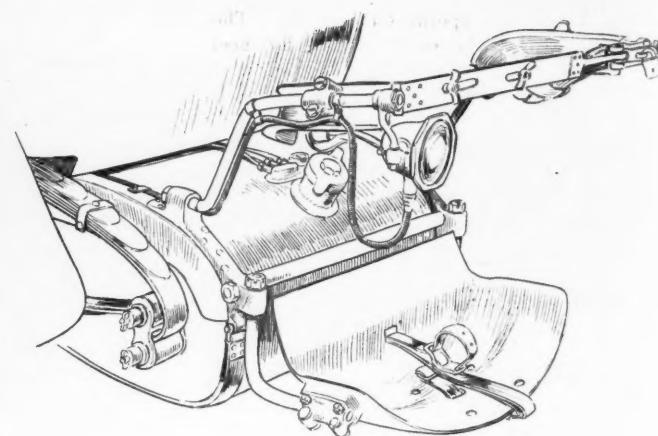
Improvement in Body Work

Body work shows an improvement in cleanliness of design. The absence of protruding rivet heads on the fenders adds greatly to the appearance. The standard bodies have a modified stream line form.

The general design of both the 38 and 48 motor is similar. Cylinders are T-castings in groups of two, with water-jackets integral with exception of the separate waterjacket caps. The pistons



LOCOMOBILE BIG SIX WITH RIGHT DRIVE



NEW PRESSURE FEED TANK AND TIRE RACK

are of gray iron and in the larger motor are 5.5 inches in length. They are fitted with five rings, four located above the wrist pin and the fifth, which serves as an oil distributor, at the bottom. Wristpins are held in their places by two studs locked by a wire passing across their inner extremities. The wrist pin material is chrome nickel-steel case hardened and it is fitted with a bronze bushing to take the upper connecting rod bearing. The diameter of the wrist pin is 1.125 inch on the 48.

Features for Silence

Throughout the car several silence features are noticeable. The cast aluminum cowl is a unit with the dash being bolted to the body sills. A layer of woven cotton belting material is inserted between the body and the frame preventing body squeaks. The doors close against blocks of solid rubber which silences the noise of closing and prevents rattles. The tire brackets are in the rear and are solidly connected to the frame. They are of drop-forged material and cannot possibly rattle or become loose.

The lamps, license brackets, etc., are all solidly connected to the car in such a manner that they cannot possibly work loose.

Many conveniences will be found on the car in the line of modern accessories. Chief among these is a single-cylinder air compressor by means of which the 37 by 5 inch tires can be inflated to 90 pounds in about 2 minutes. This air compressor has a bore of 2.5 inches and a stroke of the same length. It is mounted on a extension of the front end of the gearset countershaft and driven through a jaw clutch which can be engaged or disengaged by a T-shaped handle located on the left side of the car through a small door in the side of the running

board shield. The handle is drawn outward about $\frac{1}{16}$ inch and advanced one notch to the left. This engages the jaw clutch and the pump is ready for use. The air is drawn in through holes drilled around the bottom of the cylinder of the pump and on the up-stroke of the piston the air is forced out of the cylinder by lifting a flat valve. This allows the air to pass into a small tank to overcome the pulsations of the pump and from there it passes on to the tires. The pump is so arranged that nothing but pure air can reach the tires.

The little six is 4.25 by 5 inches. The big six motors are 4.5 by 5.5 inches. The S. A. E. horsepower of the small six is 43.35. The S. A. E. horsepower of the big six is 43.6. The actual horsepowers of the two motors are respectively 63 and 82. These ratings are 1,800 revolutions per minute.

Locomobile Engine Details

Connecting rods for the little six are 11 inches in length and 12 inches for the big six. They are composed of chrome nickel-steel. The crank bearing on the big six connecting rod is 2 inches in length and on the little six 2 inches. Both engines have seven-bearing crankshafts. The bearings, located between the cylinder castings, are longer than those located between cylinders in the same block. On the big six the length of the bearings between the cylinder blocks is

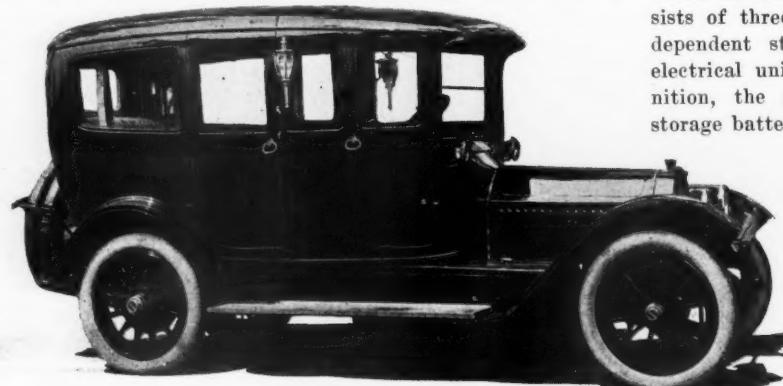
2 $\frac{1}{16}$ inches and the bearings between cylinders in the same block are 1 $\frac{1}{16}$ inches. The material used in the crankshaft is chrome nickel steel and the bearings are all lined with Parsons white metal.

Valve Operation

The drive of the valve mechanism is taken from a spiral gearset, located in a case at the front end of the motor, through a camshaft which has the cams cut integrally. The cams act directly on roller followers which transmit the motion to the pushrods. The latter are carried in exceptionally long guides which provide a means of checking oil leaks and give a rigidity to this mechanism. The valve mechanism is not inclosed but silence is secured by close work in the valve parts. The cold clearance between the bottom of the valve stem and the pushrod is .004 inch. This is taken up when the motor becomes warm. The grinding limit on the spiral gears which drive the valve action is .00025 inch.

The cooling system is operated by a centrifugal pump located on the exhaust side of the motor near the forward end. This takes the water from the radiator and forces it through a long manifold which is lifted above the generator and pump shaft. The radiator is a cellular design and is further cooled by means of a six-blade aluminum fan mounted on a bracket fixed to the timing gear case.

The electrical equipment of the car consists of three machine units and two independent storage batteries. The three electrical units are the magneto, for ignition, the generator for charging the storage battery and operating the lighting system and the electric motor for cranking the engine. One of the storage batteries is used for ignition and the other is used in connection with the lighting and cranking system. By the use of the magneto and the three-cell 6-volt storage battery a dual ignition system is



LOCOMOBILE LITTLE SIX, BERLIN

provided. The generator is driven off the pump shaft and operates at 6 volts. The cranking motor is geared to the flywheel and is only in engagement in starting the engine. Depressing a pedal puts the cranking motor in engagement and at the same time starts it spinning the engine. The starting and lighting battery is of Willard manufacture and has a capacity of 120 ampere-hours.

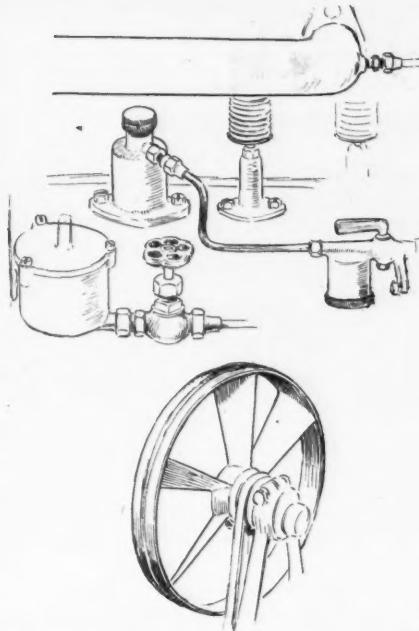
The oiling system is a force feed which takes the oil from the reservoir in the crankcase and by means of a gear pump forces it in a steady stream to the motor bearings. A new feature of the oiling system is an accessible oil drain which can be reached simply by raising the bonnet. By its use the oil can be drained down to any desired level and does away with the necessity of crawling beneath the car to reach the drain cocks.

The clutch used on all models is an all-steel multiple disk. It has forty-three saw-steel blades housed within the flywheel. This type of clutch runs in oil and the manufacturers use and recommend engine oil and kerosene in equal parts. The clutch disk retainer is carried on a double row of ball bearings at the motor end and a single row of ball bearings at the rear end. The entire clutch is removable from the car without interfering with the gearbox or any other part of the car. This is a feature which materially aids in cutting down repair bills on this part of the car.

Locomobile Gearset

The Locomobile gearset provides four forward speeds and a reverse. The reductions between motor and rear wheels are respectively as follows: Fourth speed, 3.54 to 1, direct; third speed, 4.95 to 1; second speed, 6.79 to 1; first speed, 14.15 to 1; reverse, 20 to 1.

The drive shaft has a universal joint at each end, and is not inclosed as the torque and distance functions are taken care of by a pressed steel tapered channel torque beam and a pair of radius rods. The pressed steel torque channel beam is lightened materially without altering its



AUTOMATIC PUMP FOR PRESSURE FEED WITH CONDENSER—NEW SOLID FAN

rigidity to any extent, by having lightening holes cut in the web of the channel. The radius rods are steel castings, flexibly bracketed to the frame. With this combination of torque and radius members the springs are free. They have no other duty than to support the weight of the car and to neutralize the irregularities of the road.

A floating axle transmits the drive from the shaft to the rear wheels. The bevel type of drive is employed and the axle shafts are of chrome nickel steel. The axle housing which supports the weight of the car is of interesting construction; it is built up of steel tubes which are pressed together under a hydraulic force of 9 tons and then riveted.

Braking Arrangements

Wood artillery wheels are used and both sets of brakes act upon drums carried by the rear wheels. The internal expanding brake set has an effective braking surface 14 inches in diameter and 2 inches in width. The external contracting brake

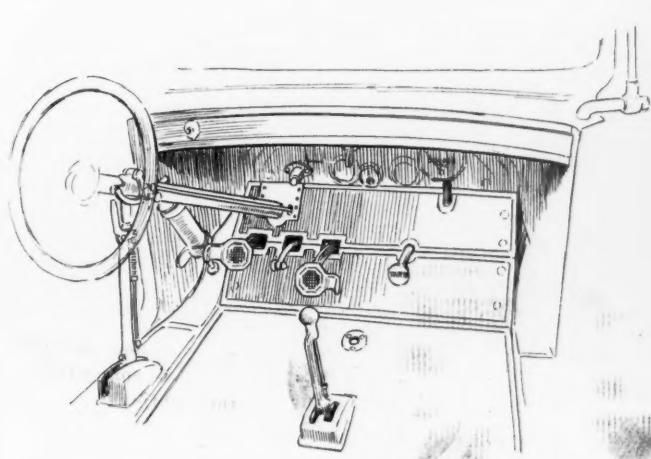
dimensions are 14.4375 inches diameter by 3 inches face width. The brake adjustments are made by right and left threaded nuts on the emergency set and by winged nuts on the service brakes. The brakes act through an equalizing bar mounted transversely across the frame and braking strains are all taken through the radius rods.

A solid I-beam front axle is used. It is drop-forged from a one-piece nickel steel bar having a tensile strength of 87,000 pounds to the square inch. The spring pads are forged integrally with the axle and are featured by the heavy dowel pin passing through the center of the front spring. This pin takes the drive from the springs and transmits it to the front wheels. It also takes the steering strains.

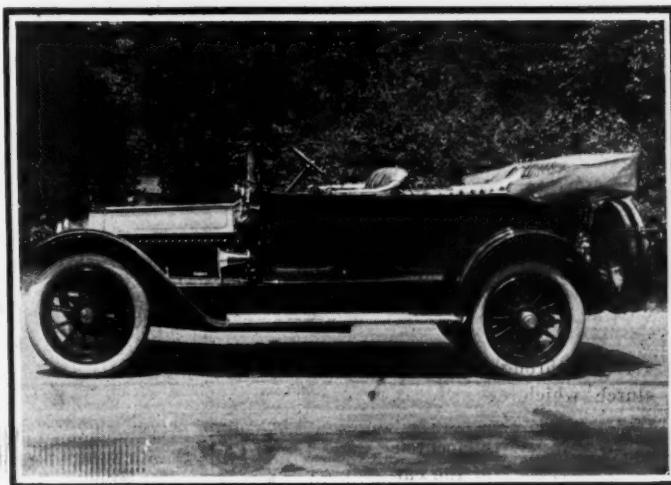
Timken roller bearings are used for the front wheels and roller bearings also are used on the steering gear which is of the worm-and-gear type. It is a feature of this steering gear that six adjustments for wear between the worm and nut are provided by simply removing the steering lever and turning a hexagonal nut bringing a new sector of the gear in mesh with the worm. The worm and gear are both case-hardened.

CASE REPORTS GOOD YEAR

New York, Nov. 15—Gross sales of the J. I. Case Threshing Machine Co. for the first eight months of the company's fiscal year, totaling \$8,197,554, indicate that the current year will be the best in the company's history. This figure represents an increase of \$863,899 over the corresponding period of 1912, when gross sales aggregated \$7,333,655. As considerably the greater part of the company's business comes in the last half of the company's year it is estimated that the company should show \$15,000,000 gross for 1913. This compares with \$14,626,634 gross last season. Gross business for the six months of 1913 was \$4,212,458, which compared with \$4,406,901, the total sales for the full year 1908.



DASH SHOWING LEFT DRIVE CENTER CONTROL



LOCOMOBILE LITTLE SIX WITH LEFT DRIVE



The Readers' Clearing House



WANTS TO MAKE HEATER FOR CAR Exhaust Heaters Are Successful—Must Be Properly Designed

COLDWATER, MICH.—Editor Motor Age—I would like to make a heater for my car and use the exhaust gas as the heat agent. Would the design shown in Fig. 1 be good and what would be the objections to constructing the heater as shown with two pipes tapped into the exhaust at A and B and the coil placed in the tonneau?—James Kieley.

Using the exhaust gas to heat the tonneau of a car has been done successfully, but from your plan shown in Fig. 1, one cannot tell the size of pipe used. The reason is that unless the resistance of the piping and coil is less than the present exhaust line, very little if any gas will flow through the heating coil. Another thing which you neglected is the placing of a choke valve in the line. This valve should be placed at any point C and when gas is to be run through the heater, this valve must be closed. In order to avert excessive back-pressure the resistance of the coil and piping should not be more than the resistance of the ordinary exhaust line, so that the gas will have an unrestricted flow to the muffler by way of the heating coil. The number of turns in the coil must be considered, as the more turns there are the greater is the resistance.

ADJUSTMENT OF SCHEBLER FLOAT Should Be 1 1/2 Inch From Top of Bowl— Hot Water Connections

GOOD HOPE, ILL.—Editor Motor Age—How can one tell when the cork float is adjusted to the right height in the model L Schebler carburetor?

2—In taking out an old cork float and replacing a new one, the float lever was bent and I now have trouble in adjusting it properly. This model is tapped for pipe for hot water. How would it work in cold weather to tap the exhaust pipe and connect by a flexible tube to the hot-water connection on the carburetor, allowing the exhaust to pass into the jacket of the carburetor? If so, what would be the best way to connect it?—M. C. Pollock.

1—The float should be 1 1/2 inch from the top of the bowl.

2—The only objection to using exhaust gas around the mixing chamber of the carburetor is the variable temperatures obtained, due to the throttle variations. Hot water affords an even distribution of heat and exhaust gas does not. However, a few carburetors on the market which are claimed to handle kerosene pass exhaust gas around the needle valve and obtain good results. It would be best to tap the water line in two places and use hot water instead of exhaust gas.

MAXIMUM SPEED OF FOUR MOTORS Four Makes Given—Ford Shows 1,750 r. p. m.

Dexter, Minn.—Editor Motor Age—Kindly advise whether the Ford T motor is of higher speed than most others.

2—What is the maximum motor speed of the Chadwick six, Peerless 660, National 40?

3—Does the White company build steamers

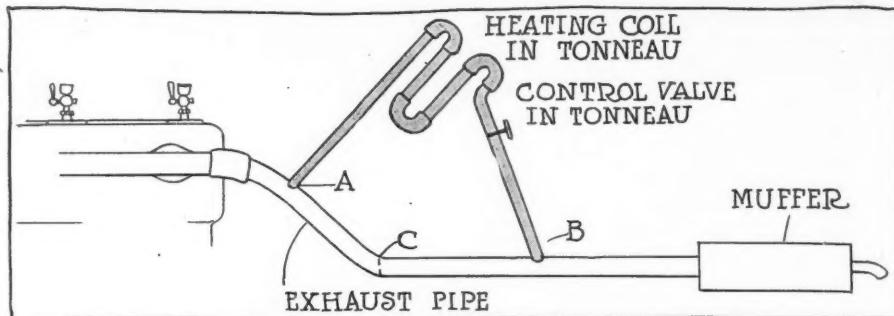


FIG. 1—SUGGESTED METHOD OF HEATING A MOTOR CAR

The idea of using exhaust heat is good but the design of the piping must be such that the heating pipes do not cause excessive backpressure

at present? If so, at what sizes, prices, and are they much changed from the 1910 or 1911 models?

4—What are the sizes, prices of the latest Stanley steamers?

5—What type burner do they use?

6—Is there any simple way of determining whether the current from a small 6-volt dynamo is direct or alternating?—L. L. Medbury.

1—No. The maximum motor speed of the Ford motor is 1,750 r.p.m., and you can see how this compares with other motors by reading the answer to question 2.

2—The makes you mentioned and their maximum motor speeds suffixed follow: Chadwick six, over 2,000; Peerless 660, about 1,600, and National 40, 2,500 r.p.m.

3—The White company has discontinued the manufacture of steam cars.

4—Stanley steam cars are made in three sizes, known as the 10, 20 and 30. The 10 roadster is listed at \$1,200, and the four-passenger touring at \$1,300. The 20 roadster sells for \$1,650, and the touring car at \$1,700. The 30 is made in seven-passenger form only and is listed at \$2,500.

5—The Stanley burner is illustrated in Fig. 2, and uses either kerosene or gasoline. The burner is a corrugated casting with slots at the top of each corrugation and in the center is three tubes. The fuel enters through the tubes and passes over the flame of the burner, thus becoming vaporized, and then passing to the bottom of the corrugations and through the slots, where it burns with a flame. The initial flame is obtained from a pilot which is always burning. This pilot acts the same as a pilot light on an ordinary gas jet.

Questions Answered and Communications Received

James Kieley Coldwater, Mich.
M. C. Pollock Good Hope, Ill.
L. L. Medbury Dexter, Minn.
C. T. Stanford, Cal.
Berton Jordan Cleveland, Okla.
E. H. Oelke Wheaton, Ill.
A. Reader Anderson, S. C.
C. B. Strohm Elgin, Ill.
F. A. Korell Key, O.

No communication not signed by the reader's full name and address will be answered.

6—To determine whether a dynamo generates alternating or direct current, get a voltmeter with a six-volt scale or over. Place the leads of the meter against the terminals of the dynamo while the latter is in operation. If the meter is direct reading and the current direct the needle will register the voltage. If the needle goes the wrong way, reverse the leads. However, if the current is alternating the needle will fluctuate rapidly when the direct current meter is connected in the line. Another simple test is to take a piece of blue litmus paper and moisten it with water. Place the leads from the dynamo on opposite sides of the paper. If the paper turns red at one end, the current is direct and the red side is the positive. If the paper does not turn red at one terminal more than the other, the current is alternating.

READER TO BUILD A WIND WAGON

This Type of Vehicle a Success for Track Work and Exhibitions

STANFORD, CALIF.—Editor Motor Age—I am contemplating the assembling of a wind-wagon, the same to be propelled by an Indian twin motorcycle engine, through a two-speed gearbox of that design and make. The body is to be constructed of light material, and motor-cycle wheels are to be used.

2—Kindly give your opinion on such an arrangement, the efficiency of the propeller, the gear ratio to be used, size of propeller, and where same can be purchased.

3—Has there ever been a successful wind-wagon? What was its speed, weight and horsepower?—C. T.

1—It will be better to answer the third question first. There have been a number of wind wagons constructed which were a success for track work and exhibition, but not for ordinary work. Speeds of a mile a minute have been attained on the level with following wind. The disadvantage of the arrangement is that every change of wind direction effects the speed and thrust.

2—You will not need a two-speed gearbox for a wind wagon.

3—As to the propeller efficiency, this is entirely a question of design of the rest of the car and is directly related to its

weight, wind resistance, etc., so that to state the gear ratio would be merely to guess. It is probable, however, that with the motor size which you mention it would be better to drive a propeller of about 6-foot diameter and 3½-foot pitch direct from the motor shaft and use this as the basis of other experiments.

WOOD OR DENATURED ANTI-FREEZE

Former Grade of Alcohol Is More Efficient as an Anti-Freeze

Wheaton, Ill.—Editor Motor Age—Tell me the relative efficiency of wood and denatured alcohol for radiator use?

2—Give the names of manufacturers who make a car that can be used as an ordinary car in fair weather, but which can be converted into a sort of coupe body for winter and stormy weather.—E. H. Oelke.

1—Wood alcohol is more efficient as an anti-freeze agent than denatured alcohol. A solution of 30 per cent wood alcohol of about .96 specific gravity freezing at about

—10 degrees Fahrenheit and a similar solution of denatured freezing at about +8 degrees Fahrenheit. A wood alcohol solution of 60 per cent with a specific gravity of about .92 will freeze at about —50 degrees Fahrenheit, whereas a similar denatured solution will freeze at about —19 degrees Fahrenheit. The wood alcohol is objected to mainly because of its odor.

2—The body type to which you refer is a landauet and is really a convertible coupe, having facilities for transformation into an open or closed car. Any of the high-priced makers furnish such body styles upon their chassis, and the moderate-priced and low-priced cars may be equipped with this type as a special order. Studebaker and Hudson market as part of their 1914 line bodies called landau-roadsters, which may be transformed from roadster into a very serviceable coupe. Kline has a roadster to which a coupe top may be fitted. It is called the detachable coupe-roadster.

MAGNETO CONFUSES SOUTHERNER

Does Not See Armature Move in Inductive Type Magneto—Hupmobile Date

Anderson, S. C.—Editor Motor Age—In a Remy magneto fitted to a Buick truck, the generating coil does not move, nor does the magnetic field, so far as I can see. How is the current generated?

2—Are the front-wheel bearings of the Hupmobile 32 adjustable?

3—Is the coil in a Bosch duplex system, described in Motor Age October 2, an induction coil or a single coil? Could the coil be left out?

4—How far should a set of piston rings in a 3½-inch motor run, having been well oiled and cared for? What about 10,000 miles? The car is geared 3.5 to 1.

5—How much will a Hupmobile 32 make on a gallon of gasoline. How much on a gallon of oil?—A Reader.

1—The Remy magneto of which you speak is known as one of the inductor type, the inducing conductors of which, instead of rotating through the field, are stationary windings placed within the field. The cutting of the lines of force is accomplished by what is called a rotor, which is a piece of soft iron operating in the field in such a way as to cause the lines of magnetic force to be broken

or removed from the winding temporarily.

2—Yes. The bearings are Timken roller and are shimmed. The shims lie between the bearing and the spindle shoulder. Increasing the number of shims brings the bearing forward, and decreasing drops the bearing back.

3—It is an induction coil containing a primary and secondary winding. It could not be left out and still have the system retain its present features. If it were left out there would be no battery circuit.

4—Piston rings well oiled and well fitted at the beginning will average about 8,000 miles. Some owners have run 20,000 without replacing the rings, and others have had to use new rings at 5,000 miles.

5—The Hupmobile 32 will average close to 20 miles to the gallon. In Detroit, tests have shown an average of 25. One quart for each 100 miles is a fair average for oil consumption.

ELGINITE WANTS A SQUARE DEAL

Complains of Treatment Given by Makers and Dealers—Looks for Remedy

Elgin, Ill.—Editor Motor Age—Having read Motor Age for about 2 years, I conclude that it desires to benefit both manufacturers and purchasers of motor cars. I believe that knowledge is acquired only by making inquiries, and, therefore, assure Motor Age that this letter is written for the purpose of deriving information; not for the purpose of relating troubles, or in any way seeking comfort for past injuries. I am going to recite a very few of the great many unpleasant experiences I have had since owning a motor car.

I purchased a roadster at a time when I knew very little about tires. I had not run the car more than 300 miles, when a rupture occurred in every tire. I investigated, and found that, according to the standard schedule of tire sizes, my car should have been equipped with 4 inch tires, instead of 3½ inch, and the weight of the car was such that 4½ inch tires would not have been unjustifiable. I endeavored to reason with the car manufacturer, but it was of no avail. I was told to take the matter up with the maker of the tire. Had I done so, the tire maker would have asked about the weight of the car, and naturally would have ignored my case. I was obliged to purchase a

full set of 4-inch tires, receiving absolutely nothing for the set of 3½ inch tires.

From the very day I purchased the car, the carburetor worked badly, and when the car was running as fast as 30 miles per hour, it would suddenly come to a dead stop. I asked for a new carburetor, and finally received one, after battling with the manufacturer of the car, through the mails, for a couple of weeks, but was obliged to pay expressage both ways.

On one occasion I had the cylinders taken off a motor for the purpose of having the carbon removed. I was told that I could take my car out of the garage Thursday morning. At that time the car would not start, and did not start until the following Sunday afternoon, when it was discovered that the four exhaust valve cages were put back so that the exhaust ports did not open into the manifold, but against the sides of the cylinders. When I received my bill, I was obliged to pay for the labor of two mechanics from Thursday morning until Sunday afternoon, the time it took them to find their mistake.

From a tire protector concern, I ordered two 35 by 4 protectors. When they arrived, they were at once installed. One worked perfectly; the other jumped off every 50 miles, approximately, at which time it ruined a tube, and broke a clincher bead on the tire. A complaint was made to the factory, and the protector was then returned. It was found that I had received a 4½ inch protector instead of 4 inch. I was obliged to pay expressage both ways, stand the cost of about one-half dozen tubes and at least one ruined casing.

Why it is that some of the men in the motor car industry do not consider it to their interest to do business fairly and legitimately; in the same manner that men engaged in other lines are obliged to operate? Is it because the men in the motor business are inexperienced, never having learned the wonderful value of "a satisfied customer"? Is it because the motor car is so fascinating that men who can afford it will have one at any cost, and stand any kind of abuse? When will this condition adjust itself so that a man will receive full value for his money, considerate and reasonable treatment?—C. B. Strohn.

On Storing for the Winter

Key, Ohio—Editor Motor Age—On account of the condition of the roads in the country, I am obliged to store my car for about 4 or 5 months.

1—Should I empty the carburetor? I have carefully strained the gasoline through chamois skin.

2—Would it be advisable to remove the radiator?

3—Should I put oil in cylinders? If so, how much in each?

4—What should be done with casings and inner tubes?

5—What other suggestion would be offered for now and for next spring when I again wish to use the car?—F. A. Korell.

Instructions for preparing a car for winter storage were given in the repair shop department of Motor Age, October 30.

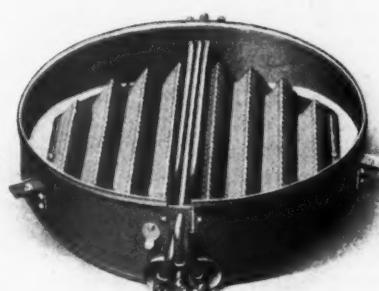
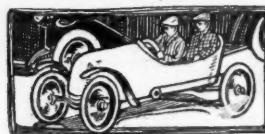


FIG. 3—BURNER OF STANLEY STEAMER
The fuel is passed over the flame and thus partially vaporized



Cyclecar Development

Fuel Economy Should Be Officially Proved

By William B. Stout

THE cyclecar is in need of the right kind of publicity. Makers who have cars running on the road are neglecting an opportunity to let the public know exactly the accomplishments of which these little cars are capable.

For example, a number of dealers and even makers who have cars at the paper stage, are claiming 50 and 60 miles a gallon as a fuel average. True, these figures have been attained abroad, but on the imperial gallon—about one-fifth larger than our gallon. The average American 9-horsepower twin motor makes about 35 miles per gallon in the average user's hands, and less if not properly adjusted. Even this is not official, however, and the public wants to know.

The next trip made by a cyclecar should be made a research trip, and actual data should be taken on the fuel used. This should be measured at the start and attested by witnesses, each stop for fuel should be given and the amount taken on, and at the end of the journey the amount left in the tanks measured by an outside party. The distances should be given by a registered odometer, and in fact all the run should be handled to give the public authentic information that it is waiting for. The firms doing this will obtain publicity to more than pay for their pains.

Together with the report should be included photographs of road conditions and hills, a statement as to weather, the date, and the weight of cars unloaded and loaded. The matter of cyclecar weight has been too much guesswork. This should be stated actually.

A cyclecar is to start for a run from coast-to-coast within a short time, according to the plans of a certain company. If this trip is made there should be an accurate log of each day's travel sent from each night's stop by plainly dated, time-stamped mail to some authentic club or organization, containing the fuel, road, weather and distance reports with notes of repairs, tire trouble, cost per day of the trip, etc. This would give figures valuable to the whole industry, and at the same time give wide publicity to the firm carrying the idea through. The life of tires, and belts if used, would be an interesting item and the average time taken on tire repairs. It would be just as interesting to know of the roads where the cyclecar couldn't go as to know of roads where it passed other cars. Every breakage would teach a lesson of the ease with which these little cars can be repaired beside the road.

Whether it is a coast-to-coast trip or an inter-city run of 500 miles, here is an opportunity for several makers.

Answers to Inquiries Concerning Cyclecar Construction

NO TWO-CYCLE MOTORS MADE YET

Four-Cycle Engines May Be Had, However, From Three Makers

DEADWOOD, S. D.—Editor Motor Age—Where can I purchase a two-cycle two-cylinder, air-cooled engine from 10 to 15 horsepower?

2—What would be the approximate weight and price of same? I want a speed of 800 to 1,200 r. p. m.

3—Where can a two-cylinder, four-cycle air-cooled motor of 10 to 15 horsepower be purchased, with a speed of about 1,500 r. p. m.? What would be the cost?—J. H. Crawford.

1 and 2—We know of no two-cylinder motor of the two-cycle type which would fulfill the requirements you mention and yet be light enough for cyclecar work. The only ones in use are for motor boats where the load is constant, as a two-cycle motor works best at one speed.

3—Write the Wizard Motor Co. Indianapolis, the Spaeke Machinery Co. Indianapolis, and the Mack Motor Co. Milwaukee, Wis. These are all twin air-cooled motors of around 9 horsepower rating, giving ample power for cyclecar work. These are of the V type and weigh around 100 pounds. The Mack motor can be had with a friction disk and thrust bearing in unit.

AERIAL ENGINES AS POSSIBILITIES

Two Makes of This Type of Motor for Airships—May Meet Requirements

Chicago, Ill.—Editor Motor Age—In Motor Age, October 2, I note in the cyclecar columns the statement that there are no horizontal opposed engines in America that answer requirements. Now, I do not regard myself as a last authority on engines, but I am especially interested in seeing this type of engine developed and would like to offer a few suggestions.

If there is none of this type in America suitable for cyclecars, they could and should be quickly developed. I am inclosing two clippings one of which shows the Gray Eagle 16-horsepower air-cooled, horizontal opposed aviation engine; the other shows the Detroit Aero power plant 30-horsepower air-cooled, horizontal opposed. In British "Flight" for December 14, 1912, are listed the Fox four- and six-cylinder, 60- and 90-horsepower opposed, water-cooled engines made by the Dean Mfg. Co., 225-A Front street, Newport, Ky.

So far I have not learned as much of this engine as I would like to, but undoubtedly it could be furnished in smaller sizes if wanted; or the air-cooled engines mentioned could be made water-cooled. All these engines are quite low in price as they stand, and if there were sufficient cyclecar or other demand for them, they could well be produced at more suitable prices, in lower powers, and more especially adapted to whatever use they would be put.

I am sure these companies would be more than glad to cater to the cyclecar or other trades, for they would then be better able financially to further develop their aviation engines. This matter need only be brought more forcibly to their attention to make them see their opportunities in this direction; and I am sure that Motor Age and similar journals could give much valuable assistance in this matter. It should not be necessary for America to import such an unduly large number of engines. There is far too much of this sort of thing going on as it is. If American motor car engine, aviation engine,

farm engine and other engine interests would get together more, they would do one another a vast amount of good. As it is these various interests are too prone to narrowly stand apart to starve and stagnate separately. Specialization is an excellent thing to a certain extent, but it should not be carried to such harmful extremes as it is in the present American internal-combustion engine industry.

I am sure Motor Age and its contemporaries could do much to bring about a better condition of affairs, for some such agitation as I suggest would do more than any other one thing to develop the horizontal opposed and other type engines, as well as to give a healthy prosperity to the American industry in general.—J. B. McQueeny.

MAKES OWN CYCLECAR AT LOW COST

Davenport Enthusiast Turns Out Exceedingly Simple Machine

DAVENPORT, Ia.—Editor Motor Age—Fig. 1 illustrates my cyclecar. It is exceedingly simple and has a very low cost of construction. It is driven by a small single-cylinder, four-cycle, 3-horsepower, water-cooled motor. The drive from motor to jackshaft is by a 2-inch flat canvas belt. An idler is used to tighten this, which is left slack when motor is running idle. From jackshaft to rear wheels the drive is by $\frac{1}{8}$ -inch V belt.

Only one wheel drives at a time, as you will see by the different sized pulleys on the shaft. I have had no trouble in getting traction with this method. For driving on the level I use the large pulley and wrap the small belt around the seat. The large

pulley gives me a range of speed up to a little over 25 miles per hour. When approaching a hill which is too steep to be negotiated on high it takes but a few seconds to change belts. The small pulley gives me a maximum speed of 15 miles per hour.

When the V belts get slack, instead of cutting a piece out of each, I tighten it by moving the rear axle. This is done by lengthening the radius rods. These rods are threaded for about 3 inches at the axle end and fit into a socket threaded for the same length, and all that is needed is to take the rods out of the fastener to the frame and give them a few turns and replace in the holders.

The frame is 10 feet long and made out of $1\frac{1}{2}$ by 2-inch white oak lined with $\frac{3}{16}$ by $1\frac{1}{4}$ -inch steel, $\frac{1}{4}$ -inch bolts being placed about 10 inches apart holding the steel to the frame. The motor is mounted on cross members, below on a frame, of $\frac{3}{8}$ by $1\frac{1}{2}$ -inch steel. The other cross members are of white ash.

The wheelbase is 102 inches, the driver's seat being placed near the center and a little to the right. The passenger's seat is at the rear and a little to the left. The front springs are three-quarter elliptic and the rear are elliptic. The front axle is I-beam and the rear steel tube. These

wheels and axles I procured quite a while ago and have saved them for making a car of this sort. The tires are $1\frac{1}{2}$ -inch, but I intend putting motorcycle wheels on the hubs, thus giving me 1 inch larger tires. At the end of the steering rod there is pinned a small arm and from this a rod leads to one knuckle and a tie rod from this one to the other.

There are two pedals, one operating the idler or clutch and the other a band brake acting on a small drum on the jackshaft. Later I intend fitting a brake to the V pulleys on the rear wheels and working it from a lever at the side of the car. The spark and throttle control levers are at the left of the seat. Although the system of flat belt to jackshaft is not entirely practical, I find that after all the stretch has been taken out it works fairly well.

No doubt you will notice the position of the driver's seat. This position may not look comfortable, but it is very much so and it also lowers the center of gravity. Last evening a passenger and I took a right-angle turn at over 20 miles per hour and did not receive the least tip. As you see the car, it is in the rough. I intend to put a small stream-line body on it.—Miz.

AMERICAN MAKERS OF CYCLECARS Sizes of Engines Required and Where

They May Be Obtained

Minneapolis, Minn.—Editor Motor Age—Kindly publish a list of firms making cyclecars.

2—Also the names of firms making two-cylinder, V-type motors suitable for such cars.

3—How much horsepower should a cyclecar engine have?—H. O. Arthur.

1—Below is a list of cyclecar manufacturers to date. Three or four of these concerns have cars on the road, while many of the other anticipate putting cars on the market early next year.

American Cyclecar Co., Detroit, Mich.

Automobile Cyclecar Co., Detroit, Mich.

American Voiturette Co., Detroit, Mich.

Batteman & Booth, Detroit, Mich.

Blood Bros., Kalamazoo, Mich.

Brown Cyclecar Co., Asbury Park, N. J.

Continental Engine & Mfg. Co., 411 Arthur St., Minneapolis, Minn.

Cricket Cyclecar Co., 88 Congress St., Detroit, Mich.

Davis Cyclecar Co., Detroit, Mich.

DeCross Cyclecar Co., Cincinnati, O.

Detroit Cyclecar Co., 510 Free Press Bldg., Detroit, Mich.

Downing Cyclecar Co., Detroit, Mich.

Dudley Tool Co., Menominee, Mich.

Duryea Motor Co., Saginaw, Mich.

Economycar Co., Indianapolis, Ind.

Falcon Cyclecar Co., Cleveland, O.

Fenton Cyclecar Co., Fenton, Mich.

Flagler Cyclecar Co., 2829 N. Halsted St., Chicago, Ill.

W. S. Frazier & Co., Aurora, Ill.

Gadabout Motor Corp., Suite 707, 29 Broadway, New York, N. Y.

Hinchman-Baker Co., 503 Free Press Bldg., Detroit, Mich.

Imp Cyclecar Co., Auburn, Ind.

Dayton Cyclecar Co., Joliet, Ill.

J. P. L. Cyclecar Co., Detroit, Mich.

Los Angeles Cyclecar Co., Los Angeles, Cal.

H. Jordan Mackenzie, 1001 Hennen Bldg., New Orleans, La.

Motorkart Co., Tarrytown, N. Y.

Mercury Cyclecar Co., Detroit, Mich.

A. E. Osborn, 2058 Valentine Ave., New York.

Princess Cyclecar Co., 1311 Dime Bank Bldg., Detroit, Mich.

Leigh M. Railisback, Saginaw, W. S. Mich.

Ritz Cyclecar Co., Brooklyn, N. Y.

Saxon Motor Car Co., Detroit, Mich.

Twombly Motors Co., 258 W. 69th St., New York, N. Y.

Victor Motor Car Co., 271 Diamond St., Philadelphia, Pa.

Ward Cyclecar Co., 1916 St. Paul Ave., Milwaukee, Wis.

Woods' Mobilette Co., 1509 Michigan Ave., Chicago, Ill.

Zip Cyclecar Co., Davenport, Ia.

2—V-type motors suitable for this type of vehicle may be obtained from:

Spacke Machine Co., Indianapolis, Ind.

Wizard Co., Indianapolis, Ind.

Universal Machinery Co., Milwaukee.

3—Motors should range from 9 to 12 horsepower.

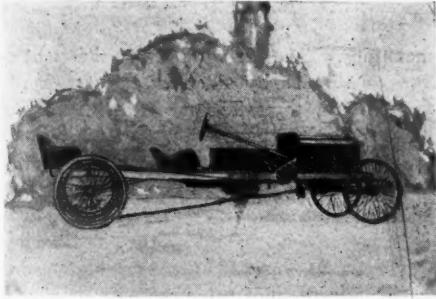


FIG. 1—CYCLECAR MADE BY MIZ

THE attitude of the recent motorcycle show in Chicago was very encouraging, its antagonism to the cyclecar proving a certain fear that there might be in the new vehicles a germ which might grow and spoil the fruit.

Several motorcycle manufacturers have been quoted as saying that it would be impossible for them with all their facilities to produce a four-wheeler which would sell for under \$500 and allow them a reasonable profit. This is true if they were to build the cyclecars with as many parts and as much mechanism as a motorcycle. The motorcycle of today, with its many features of overdevelopment, costs more to build than would a simple-type cyclecar, like the Dayton for instance, if made in equal quantities and with equal facilities. But to do this though no reliability would be sacrificed, the fussy things would need to be left off, such as power self-starters, magneto cutouts, swell-swaying seats, two-speed gearsets, dry-disk clutches. The cyclecar will have a simpler motor by far than the motorcycle, a motor more reliable and cheaper to buy and run, while it must be much quieter. A cyclecar can be made on four wheels and with three speeds and reverse which will have fewer parts than a two-speed motorcycle of today, and cost no more to build. This will be a 12-month vehicle, not a 6-months one, and will be safe on wet pavements, clean and fast.

Cyclecar Snapshots

There is talk of a cyclecar race at Elgin next year, preliminary to or following the big-car race. Cyclecars abroad have made 74 miles in an hour with a 65 cubic inch capacity motor. What can America do with the 71-inch motor allowed? Is there any reason why a cyclecar cannot equal the speed of the big cars?

Four of the big motor car companies are indirectly connected with cyclecar experiments, while dozens of the big dealers throughout the country are experimenting on their own initiative.

The cyclecar must be related to the aeroplane for the Aero Club of Illinois listened to a 60-minute talk on "The Reason for the Cyclecar," by William B. Stout, at a dinner last week. This talk took up the history of the motor car as the beginning, the overdevelopment of the motorcycle as an incident, and the growth of a new type of car as the result of the demand for cheaper motor transportation than can be given by the lightest small car. Mr. Stout predicted great things for the

new vehicle which, he said, was the result of a demand for price, and should be judged on the basis of cost entirely. "The cyclecar will best succeed which for the least money gives the most value," was his summary. "This precludes the complicated motor, gearsets, shaft drive and the like for other constructions which do the work as well and can be made cheaper. The cyclecar must equal the reliability and comfort of the big car at one-fourth the upkeep. The cars that can do this will succeed." The discussion which followed brought out the fact that four members of the club were actually building cyclecars with hopes of later manufacture.

Austria has held its first cyclecar competition, which attracted enormous crowds and brought forth a number of new machines not previously seen in competition. The cyclecar interest is just as insistent in Austria today as in England or America and is growing as the public sees what a real cyclecar is. The competition was in the shape of a hill climb on the Semmering Pass, about 60 miles from Vienna. The hill was about 6 miles long and full of dangerous hairpin turns, the gradients varying from 8 to 20 per cent. The best time up the hill was made by the single-cylinder air-cooled Globe cyclecar, in 13 minutes 18 seconds, the second and third machines being Austro cyclecars 10 and 20 seconds behind.

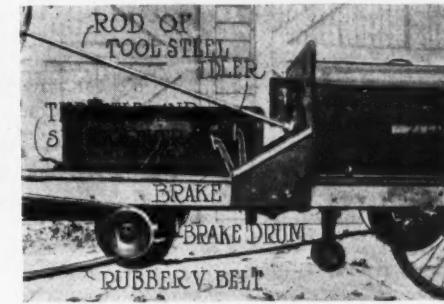
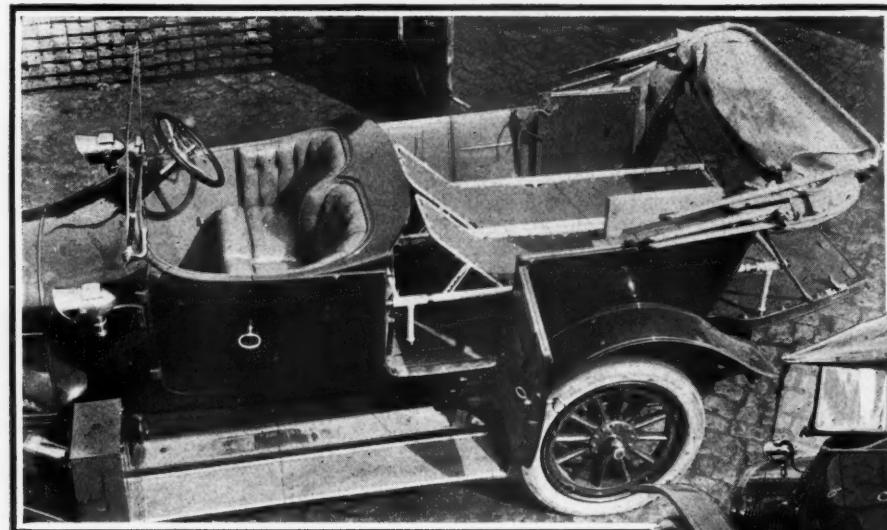


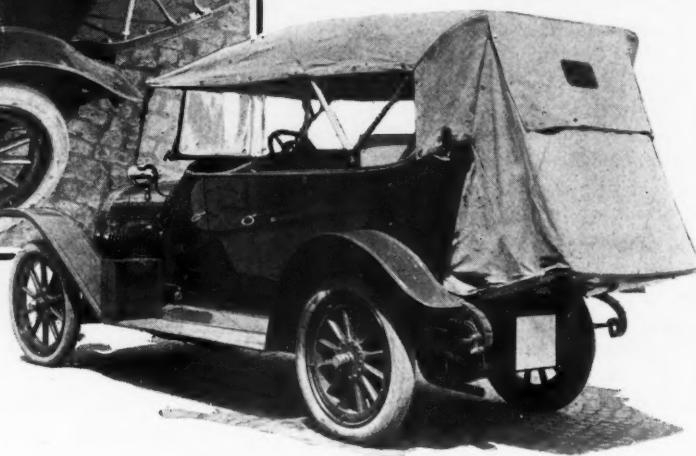
FIG. 2—SOME MIZ FEATURES



The Realm of The Commercial Car



TWO VIEWS OF GERMAN TOURING CAR THAT CAN BE CONVERTED INTO AMBULANCE



French Army Officers Want Standardization

IN next year's French army trials, to determine the vehicles eligible for government subsidies, particular attention will be paid to standardization and special classes will be provided for four-wheel drive tractors and to colonial-type trucks. The practical road test will be about the same as this year, and will be followed by a most searching technical examination of the mechanism of each machine, only sound vehicles having covered the full distance and having attained a certain economy in fuel and oil consumption being accepted.

Minimum Load 2 Tons

The useful load must be not less than 2 tons for a dead weight of $3\frac{1}{2}$ tons maximum. The dead weight comprises chassis and body with water, oil and fuel, but without tools and spares. Solid rubber tires only are admitted. Pneumatics and rubber blocks are excluded. Rim diameters have now been reduced to three: 770 millimeters (30.3 ins.), 850 millimeters (33.4 ins.), and 1 meter (39.3 ins.). Tire widths per load must conform to the following table:

| Width of Tire | Maximum Load on Steering Wheels | Maximum Load on Driving Wheels | Minimum Width of Rim | |
|---------------|---------------------------------|--------------------------------|----------------------|------------|
| Inches | Pounds | Pounds | Single Tires | Twin Tires |
| 3.5 | 1543 | 1322 | 4.3 | 7.9 |
| 3.9 | 1873 | 1653 | 4.7 | 8.7 |
| 4.3 | 2314 | 1980 | 5.1 | 9.5 |
| 4.7 | 2645 | 2314 | 5.5 | 10.3 |
| 5.1 | 3086 | 2645 | 5.9 | 11.1 |
| 5.5 | 3527 | 2970 | 6.7 | 12.6 |
| 6.3 | 4400 | 3747 | 7.0 | 12.6 |

On the colonial models the standard rim dimensions are 33.4 and 39.3 inches.

The maximum load for a given tire section is lower than for the ordinary army trucks. For instance, for a tire width of 5.5 inches the maximum loads are 3,080 and 2,645 pounds front and rear, with minimum rim widths of 5.9 inches and 11.1 inches for respectively single and twins. Some type of anti-skid chain must be fitted or be capable of being fitted to all tires.

Admit Chain and Shaft Drive

For ordinary army work both chain and shaft driven trucks are admitted. For colonial purposes only shaft-drive is allowed. Chain pinions must have not fewer than thirteen teeth. The four types of chains allowed are as follows:

| Pitch Inches | Interior Width Inches | Diameter of Rollers Inches |
|--------------|-----------------------|----------------------------|
| 1.5 | 0.7 | 0.8 |
| 1.7 | 0.9 | 0.9 |
| 1.9 | 1.1 | 1.1 |
| 2.1 | 1.2 | 1.5 |

Clearance must be 11.8 inches when loaded for the ordinary models and 13.7 inches for the colonial types. These latter must have underpan absolutely dust and mud proof, water and dustproof magnetos, and fine wire gauze air intakes for the carburetor. Carburetor and magneto must be at least 27.5 inches above the ground. A uniform type of magneto base and magneto coupling is insisted on. Connecting rod bearings must be detachable, and the motor must be so designed that it is possible to take up wear in the bearings from beneath without taking the motor out of the chassis or without dis-

mounting the cylinders. Only four-cylinder motors are accepted.

Towing hooks must be fitted at the front and rear of each truck, and must be capable of resisting a traction of 2 tons each. Four forward speeds must be provided and every truck must have lockers capable of receiving the whole of its spares. A permanent recording speed and distance indicator must be fitted to all

machines. The driver's seat must hold three men side by side, and must be protected by a top. The platform body will also carry a canvas top mounted on detachable hoops. Each hoop must be sufficiently strong to carry a load of 880 pounds when the truck is on the road. This is imposed in order that the hoops can be made use of to sling hammocks for wounded soldiers.

The road test will comprise a distance of 2,200 miles for trucks and 1,550 miles for the tractors. Average road speed for the trucks will be 10 miles an hour and maximum speed 15.5 miles an hour.

Motor Flexibility Demanded

Particular attention will be paid to the flexibility of motors. In convoy formation, with groups of fourteen, every truck must be capable of maintaining its place both on level roads and in hilly country. Inability to maintain the minimum and maximum speeds imposed by the officer in charge of the group will cause disqualification. Fuel imposed is gasoline, alcohol and benzol, and the average consumption taken over the entire distance must not be greater than 6 centiliters per ton-kilometer. The oil and grease consumption must not exceed 5 grammes. The fuel and water supply must be sufficient for a run of 125 miles. Each truck must be capable of hauling a companion truck over a well-surfaced road having an 8 per cent gradient, both trucks being either empty or fully loaded.

Four wheel-drive tractors were presented

this year, but it is not until next year's trials that they will assume real importance. It is the intention of the army authorities to encourage the development of this type of vehicle, for they believe it can render valuable service for all kinds of army work. The tractor must carry a useful load of at least 1½ tons, and the ratio of useful load to dead weight must be at least equal to 0.50. Under load or when empty, no axle must carry more than six-tenths of the total weight of the vehicle and in no case must this weight exceed 4½ tons.

Rules for Tractor Tests

The maximum weight of the tractor with load is 8 tons. The ratio of load towed to dead weight of the tractor must be at least equal to 2. Tire sizes in relation to load carried are the same as for trucks; wheel diameters without tires are limited to 33.4 and 39.3 inches, equal size wheels being fitted both front and rear. A differential lock is imposed, sand boxes must be fitted, and every tractor must have an irreversible motor-driven capstan with 165 feet of cable. The cooling of the motor must be sufficiently energetic for the tractor to haul its entire load through the capstan—the vehicle being stationary—for a period of 30 minutes.

The road test will be particularly severe. Each tractor with its maximum useful load must be capable of climbing a gradient of 18 per cent. Having its full load in tow, it must be capable of traveling over varied paved or macadam roads having 12 per cent gradients. With full load on the tractors and trailers an average speed of 5 miles an hour must be maintained for a distance of 50 miles over roads having gradients not exceeding 8 per cent. A minimum speed of 3.1 miles an hour must be maintained on 6 per cent hills with full load on tractor and trailers. The vehicle must be able to come to a standstill without any external aid on a 15 per cent gradient and then haul its trailers up the hill by means of its capstan. Sixty-five miles must be covered without a renewal of the water supply. The conditions regarding gasoline and oil

consumption are the same as for the trucks.

Provision also is made for colonial type four-wheel-drive tractors, the conditions being the same as for the colonial trucks. Useful load of the colonial tractor is reduced to 2,645 pounds, the maximum axle weight is 3½ tons, and total weight of the vehicle must not exceed 6 tons.

GERMAN AMBULANCE IDEA

A German concern, the Neue Automobil-Gesellschaft, Ltd., of Berlin, has introduced a body that can be used for touring purposes and which is convertible into an ambulance. In the latter form it hardly can be distinguished from the ordinary touring car. The ambulance feature is secured by means of stretchers which, when folded, are kept below the rear seat. After raising the latter they are fixed at the head to the emergency seats. With the top up and the foot end of the stretcher protected by means of a sailcloth curtain the patient is protected either from the weather or the eyes of onlookers.

TRUCK FOR CARRYING COTTON

An electric cotton truck, the latest thing for the handling of the staple from cars to concentration yards or to ship-sides for loading, and which is so built that twenty-five bales may be carried at one time, was demonstrated in Galveston recently when the vehicle was driven with a full load through the principal streets. This truck was built by the General Motors Co. and sent to Galveston on an order of the Galveston Motor Car Co., and there was subjected to special improvements designed to make it a feature of the cotton business by the addition of what has been termed a cotton saddle.

This saddle was designed and built by John E. Mitchell, superintendent for the Moody compress, and consists of a steel platform surrounding the body of the truck, divided into compartments onto which a bale of cotton can be placed direct from a hand truck without the effort of lifting. By this improvement it is possible to load the truck to its full

capacity without extra labor in handling the bales of cotton. The capacity of the truck, twenty-five bales, is against an average of thirteen bales on the ordinary truck drawn by three mules, and in addition there is done away with the labor and lost time of stacking on the old-style platform.

The truck has a capacity of 6 tons. It can develop a speed of 8 miles an hour with a full load of cotton over paved streets and ordinary roads. The propelling power is a 20-horsepower electric motor, which gets its power from sixty H-12 Edison batteries. The motor is inclosed in a water-tight casing, the batteries being submerged in water, and no acids are used. This makes the truck fireproof and safe to handle around wharves or cotton sheds and yards.

TRUCKS SAVE PAVERS MONEY

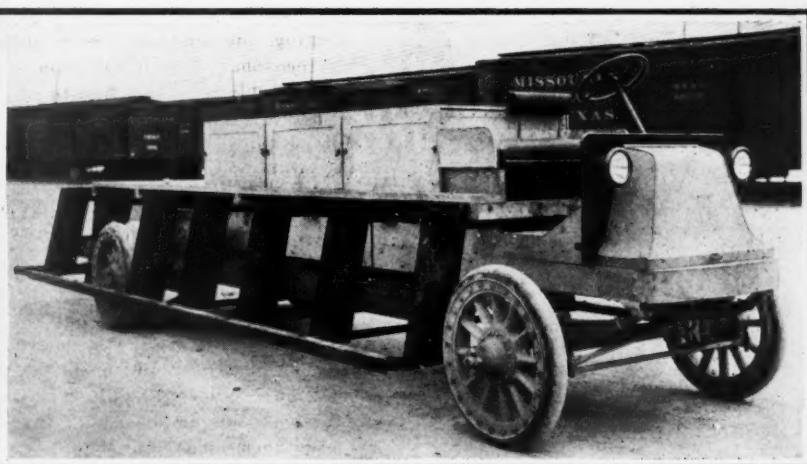
It has proven to be so much cheaper to handle asphalt or bitulithic compounds by motor truck that the proposition is being very carefully considered by several paving companies and truck makers.

The paving companies are interested not only because the material can be delivered cheaper by motor truck than by horses and will reach the job with a higher batch temperature, thus making it easier to handle and work, but because large savings can be effected in their organizations.

The Union Paving Co., of Philadelphia, which operates two Locomobile trucks equipped with an asphalt dumping body, have just given out figures showing cost of operating the two trucks during the month of August, 1913, which, although they leave out any figures relating to savings effected through concentration of plant, and carry no credits for business, which, because of its distance, could not have been handled except by this means, brings out remarkable facts. They show that truck 1, which carried 704 tons of asphalt and ran 1,294 miles during the month of August, gave net earnings of 43 cents per mile, a total of \$566.42 for the month. Truck 2, which carried 754 tons and ran 1,328 miles, earned 41 cents a mile net, a total of \$544.48 for the month.



SPECIAL BODY USED FOR HAULING COTTON IN GALVESTON



The Accessory Corner

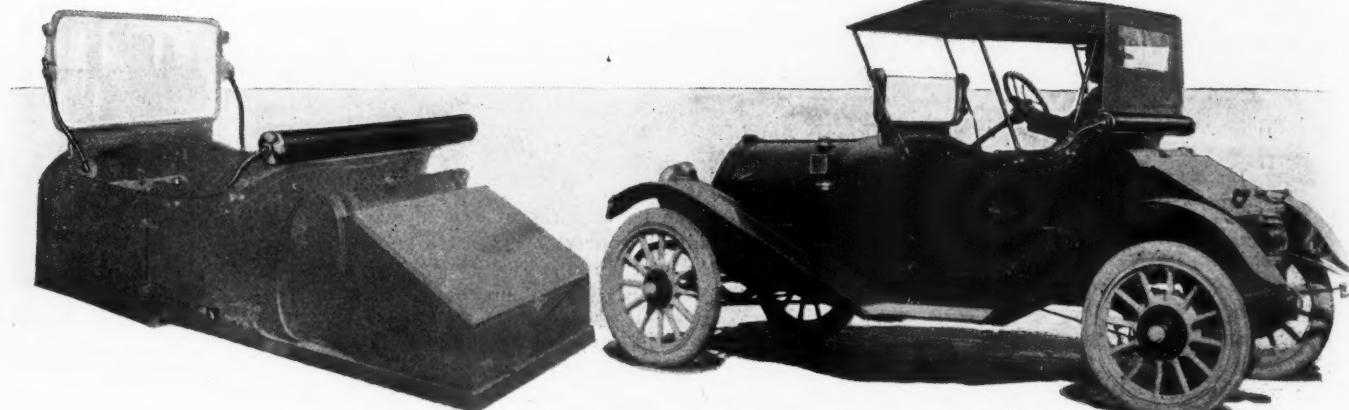


FIG. 1—EVERY ROLL TOP WHOSE SUPPORTS DROP INTO SEAT SIDES

New Federal Tire

THE Federal Rubber Mfg. Co., Milwaukee, announces the introduction of a new tire called the double-cable base tire which is claimed to be immune from side wall breaks, rim cuts, rim blow-offs and eliminates tube pinching. These ailments and others are absent in the double-cable base tire, because of the flexibility of the bead filler, and the cable base.

Into each bead is built two endless cables, as shown in Fig. 2. These cables serve to anchor the heel and toe of each

bead, to the rim, and are claimed also to prevent the possibility of the tire blowing off the rim. The double-cables are surrounded by a flexible bead filler composed of twisted strands of cotton imbedded in soft rubber. This construction is said to permit of side wall flexing where they bend to meet the outward curve of the side rings and obviate the danger of fabric breaks.

The new Federal tire is made in straight side and Q. D. clincher types.

Northland Non-skid Tires

The Northland Rubber Co., Buffalo, N. Y., is marketing a non-skid tire which, besides having its price as a feature, is said to show long life, prevent side-slipping, and aid traction. The tread of the tire is composed of embossings of the initials of the concern. The 34 by 4-inch Northland tire sells for \$24.20 and is guaranteed for 3,500 miles.

Schebler-Ford Carbureter

Attachment of the model L Schebler carbureter on Ford cars is possible now with the introduction by the Butler Mfg. Co., Carthage, Ind., of special attachments, which with the carbureter, ready for installation, sell for \$21. It is claimed that the Schebler device on a Ford gives easier starting, quicker pickup, more speed power and economy. The installation consists of a carbureter with manifold to which is attached a priming cup, fuel connection and tubing and throttle rods. Fig. 3 shows the carbureter ready for fitting.

Detroit Self-Lubricating Springs

Hard riding and squeaks due to insufficient lubrication of the spring leaves are said to be removed entirely in a new type of vehicle spring brought out by the Detroit Steel Products Co., Detroit, Mich. The feature of this spring is that the leaves are fed continually with lubricant, this being accomplished by making the leaves themselves act as grease retainers, as shown in Fig. 4. As will be noted, the leaves are not flat, but slightly concave,

so that there is a channel through which lubricant may travel. Small cups are formed near the ends of the leaves, as shown in the upper illustration, and these when filled with grease, non-fluid oil or graphite supply the leaves. The flexing of the spring causes the grease to work its way to the different parts.

When once filled the leaves need not be replenished for more than 6 months.

Avery Roll Top for Motor Cars

A top which rolls into a metal case when not in use, and whose supports drop into the seat sides, has been brought out by the Automobile Roll Top Co., Milwaukee, Wis. This top, illustrated in Fig. 1, is said to be lighter, stronger and more conveniently handled than the ordinary form of top, and requires comparatively little time for raising and lowering.

Knox Kerosene Carbureter

A carbureter which is claimed to handle kerosene successfully by preheating with exhaust gas, and one which obtains high efficiency with gasoline, has just been brought out by the Camden-Anchor-Rockland Machine Co., Camden, Me. The carbureter is known as the Knox model E and uses gasoline for starting and kerosene for running.

The fuel is introduced into the carbureter in the conventional manner, but the base of the device is in the form of a conical heating chamber. The heating chamber utilizes exhaust gas regulated by

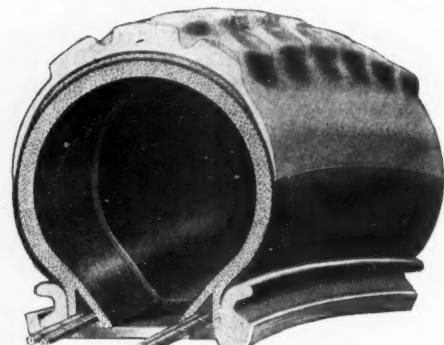


FIG. 2—DOUBLE-CABLE BASE FEDERAL TIRE

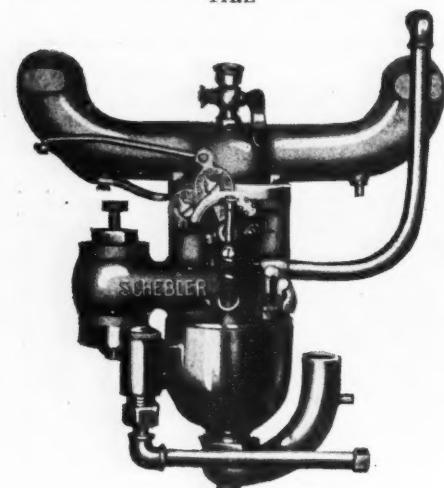


FIG. 3—SCHEBLER-FORD CARBURETER AND ATTACHMENTS

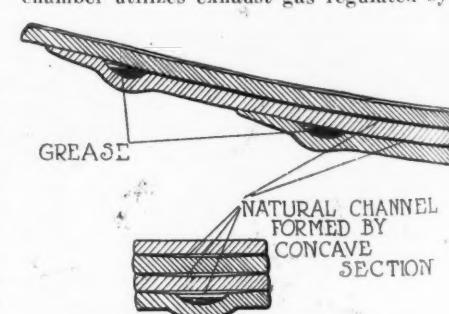


FIG. 4—DETROIT SELF-LUBRICATING SPRING CONSTRUCTION



FIG. 5—LUYTIES GLARELESS HEADLIGHTS OF ODD CONSTRUCTION

a damper in the exhaust line, the damper being controlled from the dash of the car. The damper is shown in Fig. 8, illustrating a cross-section of the Knox carbureter.

The heating cone shown in the illustration is made of soft sheet copper and has a large heating surface. The fuel passes the needle and then is forced through a series of very fine holes. The primary or positive air is introduced also through fine holes, and the result is that the inrush of air meets the fuel at right angles, almost, and thus assists atomization.

The flushing valve shown is for the purpose of using either gasoline or kerosene, and when gasoline is used it is not passed through the carbureter, but takes a separate course, as shown. After a motor has been started on gasoline, it is permitted to run a few minutes and then the flushing valve is closed and the carbureter is fed kerosene.

The maker claims that a 7 per cent increase in speed and power is gained by the use of kerosene and that greater efficiency is gained with gasoline than is obtained by other carbureters. The Knox carbureter is made in 1, 1 1/4 and 1 1/2-inch sizes.

Hartman Rotary Lighting Switch

The Hartman Electrical Mfg. Co., Mansfield, O., has brought out a new lighting switch which is of the rotary type, with a locking arrangement at each combination, so that the driver may tell when the

switch is in the desired position. The switch also has incorporated a headlight dimmer. Besides the three positions which turn on the head, tail and sidelights, a special combination is provided which permits of one side lamp only being used.

The dimming feature does not use a resistance coil, but instead changes from a parallel to a series connection in which case the lamps will burn at a lower voltage and thus give less light. A push and pull button operates the dimmer.

Luyties Glareless Headlight

A distinctive type of non-glaring headlight has been brought out by Otto Luyties, New York, which uses a domed-shaped frosted lens instead of a flat one. The feature of this headlight, besides its non-glaring qualities, is the fact that its use eliminates side lights, it is claimed.

In Fig. 5 is shown a side and front view of the Luyties creation, and it may be seen that the lens is half-egg-shaped and the center fitted with a clear space. The introducer of this headlight claims that part of the using vehicle may be seen and yet the light is not blinding and that bulbs of 20 to 40 candlepower may be used and no glare created. The Luyties light is claiming to illuminate the side of the road better than the ordinary sidelights.

Convertible Body

A body which may take the form of a touring car or roadster body, and which may be used as a sleeper, has been invented and patented by C. H. Stratton, Muncie, Ind. The top is so constructed that it may be shortened or lengthened at will to conform with the change in the body style. Fig. 6 shows how a car would appear with the touring body and the same illustration shows the same car with the body transformed into a roadster. By dropping the back of the front seat on a level with the cushions the body is converted into a sleeper.

Barnard Carbureting System

The Barnard carbureting system brought out recently by the Barnard Mfg. Co., Los Angeles, Cal., is claimed to handle kerosene, distillate, toppings, naphtha and benzine, as well as gasoline, and obtain greater efficiency with these fuels than is at present obtained with gasoline. The Barnard system consists of a generator or gasifier and a special type of carbureter.

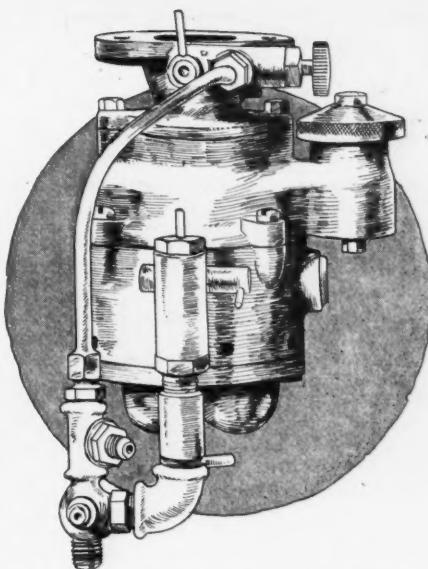


FIG. 7—KNOX CARBURETER WHICH IS SAID TO HANDLE KEROSENE

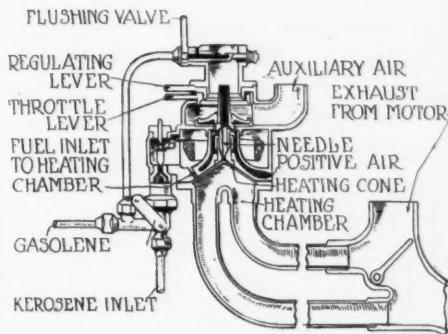


FIG. 8—SECTIONAL DIAGRAM OF KNOX CARBURETER

The generator is designed to heat the fuel after it leaves the carbureter. It is claimed that the heating of the mixture after leaving the carbureter makes the Barnard system produce better results than are now obtained.

The generator is in the form of a cylindrical brass casting containing many small tubes. The heat for the generator is obtained from the exhaust, and about 20 per cent of the exhaust gas is used for heating purposes. In tests performed recently, gasoline, distillate and gas-oil were used over a run of 325 miles in each case. The cost of fuel for the trips was respectively \$3.82, \$1.25 and \$.50.

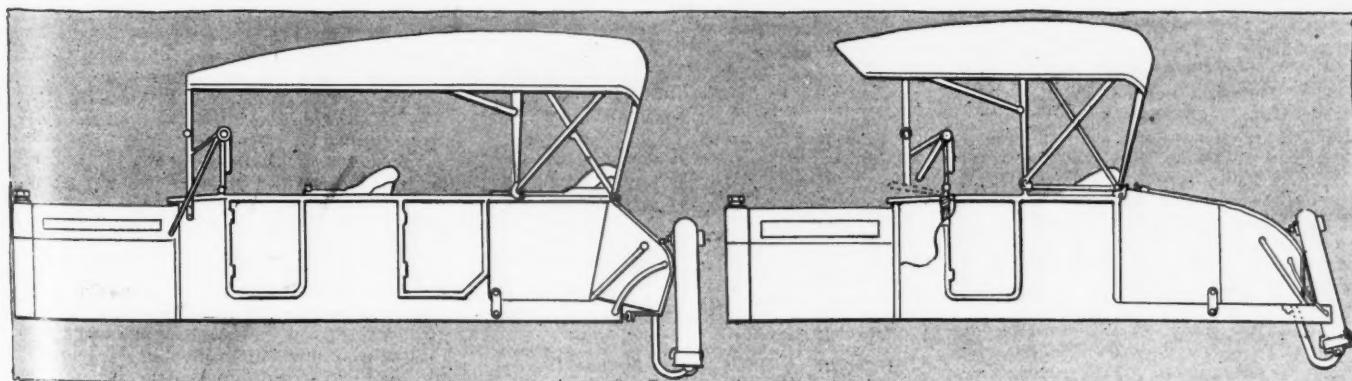


FIG. 6—BODY WHICH IS CONVERTIBLE FROM TOURING TO ROADSTER



From the Four Winds



SELECT Dates for Cincinnati Shows—The Cincinnati Automobile Dealers' Association has decided on the following dates for the 1914 motor shows: February 21-28, pleasure car exhibit; March 2-4, commercial vehicle exhibit.

New Lincoln Highway Official—At a recent meeting of the board of directors of the Lincoln Highway Association, Harold J. Larsen of Detroit was elected a vice-president, the other vice-presidents already elected being former Governor Gillette of California, Carl O. Fisher of Indianapolis and A. R. Pardinot of New York.

Milwaukee Bars Dazzling Lights—The Milwaukee common council has passed the headlight ordinance drafted by the Milwaukee Automobile Club, which prohibits the use of headlights on all vehicles, the direct rays of which lights shall strike the roadway more than 200 feet ahead of the vehicle, and prohibits the use of navigator's lights or red and green combinations on the front of vehicles. The use of glaring headlights in the city, which has long been considered dangerous, is thereby prevented. In the case of the red and green sidelight combinations, as well as the dazzling headlights, the electric railway companies supported the club's efforts because of the danger to street railway traffic.

Wealthy Senator Booms Good Roads—Isaac Stephenson, Marinette, Wis., junior United States senator, and owner of a model stock farm and considerable other real estate in Kenosha, county, Wis., has offered the Kenosha county board of supervisors the services of his attorneys to lay out a permanent highway scheme which in 10 years or less will give the county a complete system of permanent highways. Senator Stephenson, who is a multi-millionaire, has offered to stand the entire expense of building the roads fronting on his extensive real estate holdings, and make liberal donations of money toward the general county road fund, which in turn will draw an equal amount from the state aid highway fund.

Experts Discuss Electric Starters—An interesting meeting of the Indiana section of the Society of Automobile Engineers was held in the rooms of the Hoosier Motor Club, Indianapolis, on the evening of November 11, the subject under discussion being "Power Application of Electric Starters to Gasoline Engines." The branch has seldom had so many recognized experts to participate in the discussion at any one meeting. Papers on the subject were read by S. Deutsch of the Detroit Electric Appliance Co., Detroit, Mich.; T. L. Lee of the Northeast Electric Co., Rochester, N. Y.; F. E. Moskovics of the Jones Electric Starter Co., Chicago, Ill.; C. M. Tichener of the Gray and Davis Co., Boston, Mass., and S. W. Rushmore of the Rushmore Dynamo Works, Plainfield, N. J.

Racine Motorists Form Club—Motorists of Racine, Wis., finally have been brought together in a permanent organization under the title of Racine Motor Club, following several ineffectual attempts. It was left to Walter H. Reed, the new executive secretary of the Racine Commercial Club, a commercial-civic organization, to induce the organization of a motor club which is expected to withstand the trials and tribulations others clubs could not endure. The club, organized in the spring of 1912, died a natural death within a few months. The new club has elected these officers: President, Dr. E. A. Taylor; first vice-president, Stephen Bull II; second vice-president, W. F. McCaughey; treasurer,

Arthur Simonson; secretary, Walter H. Reed. The charter roll contains 75 names and the Racine club expects to equal the record made by its sister city, Kenosha, which has a club of 225 members. Clubrooms are already being maintained by the Racine club, which later intends to establish a clubhouse.

Locomobile Wins Hill-Climb—Twenty motorists of Hartford, Conn., who style themselves the Harmony Auto Club, conducted an exclusive climb over the much-mooted Avon mountain last week. While some of the members failed to enter cars for one reason or another those who did actually participate provided plenty of fun. The cars lined up at the base of the east slope of the mountain, and, observing formation climbed the long, steep grade just to warm up a bit. The time trials were held on the west slope which makes several sharp turns. The cars were sent away from a standing start at 2-minute intervals. Clayton P. Chamberlin carried off the trophy in a small six Locomobile. Ralph D. Britton in an Everitt made the next best time and Burton L. Newton in a Cadillac captured third.

Six Cent Verdict for Ford Agent—J. W. Meiklejohn, motor car dealer at Waupun, Wis., was awarded a verdict of 6 cents and costs in his action against Ernest A. Emigh, a farmer of the town of Oakfield, to collect the purchase price of a Ford car which Mr. Emigh refused to accept after his wife had signed a contract for its purchase. Emigh was solicited to purchase a car but held off. His wife was given a demonstration and at the conclusion signed a contract to purchase. Acceptance was refused by the husband upon delivery and Meiklejohn brought suit. The jury held that while Emigh did not authorize his wife to sign the order, as claimed, he did later ratify her signature by his actions sub-

sequent to the signing of the order. As the property did not actually pass because Emigh refused to accept the car, the verdict of 6 cents and costs was suggested by the judge as a fair solution of the problem.

Minneapolis After Glass Throwers—Arrest of persons throwing glass on the highways has begun in Minneapolis. Patrolman C. A. Layman of the Sixth precinct has taken the first award of \$25 by the Automobile Club of Minneapolis for the arrest of a man who was sent to the workhouse for throwing broken bottles into the street.

Over \$8,000,000 Spent on Roads—A summarized analysis of the finances of the Pennsylvania highway department given out recently shows that expenditures for 2 years, ending October 1, aggregated \$8,765,234.99. The overhead expenses or cost of operating the department have been only \$600,328.22, or less than 7 per cent.

Belvidere Motor Club Formed—At a recent meeting of motor car owners of Belvidere, Ill., a county motor club was formed and the following officers elected: H. A. Gabel, president; T. S. Beckington, vice-president; F. R. Colburn, secretary; B. R. Lucas, financial secretary, and Dr. R. W. McInnis, treasurer.

Shaw to Edit the Bulletin—Jerome T. Shaw, for the past 6 years connected with various metropolitan publications devoted to motoring and for the past 2 years associate editor of Horseless Age, has been appointed assistant secretary of the Manhattan Automobile Club and editor of the Bulletin, the house organ of that association.

Fifty Million Dollar Bond Issue Defeated—Returns from more than two-thirds of the counties in Pennsylvania show that the proposed \$50,000,000 bond issue to be used in road improvement has been defeated by a substantial plurality. The vote in 48 counties, including Philadelphia and Allegheny, on the loan was: 167,195 for it and 174,052 against.

New Road Cuts Tour Time—A new motor road between El Paso and Artesia, N. M., which will be 150 miles shorter than the old route through the Mescalero reservation, has been practically completed. The new road is 165 miles long and follows a route which makes it passable throughout the year, it is stated. The road runs from El Paso by the Hueco tanks, through Russell Gap between the Sacramento and Gualupe ranges and through Hope to Artesia. The highest elevation of the road is about 5,000 feet, or 3,000 feet less than the old route. Thirty signboards on iron posts along the route will give distances and directions. The trip between El Paso and Artesia can now be made in 8 hours, it is stated, compared with 2 days by the old route.

Would Change Rule of Road—At the last meeting of the Vancouver Automobile Club a resolution was passed calling on the city council to take a plebiscite at the next election on the question of having the rule of the road changed. Lengthy arguments were made showing the desirability of drivers taking the right instead of the left of the road. It was also announced that the club purposed strongly supporting any agitation in support of the proposed change. The point that in both the Canadian provinces to the east and the States to the south, the rule was always to keep to the right was felt to be the strongest reason for adopting the same rule in British Columbia, particularly in view of the public thoroughfares of the country, to the fact that the difference had led to several serious accidents for British Columbians tour-

Coming Motor Events

SHOWS, CONVENTIONS, ETC.
 November 20-22—Alabama Good Roads Association, Mobile, Ala.
 December 6-13—Show, Toledo, O.
 December 9-12—Annual convention of American Road Builders' Association, Philadelphia.
 December 11-20—First International Exposition of Safety and Sanitation, New York city, American Museum of Safety.
 January 2-10—Importers' Automobile Salon, Hotel Astor, New York.
 January 3-10—New York show, Grand Central palace.
 January 4-8—S. A. E. meeting, New York.
 January 10-16—Milwaukee, Wis., show.
 January 10-17—Philadelphia show.
 January 10-17—Show, Cleveland, O.
 January 10-21—Show, Brussels, Belgium.
 January 12-17—Show, Bridgeport, Conn.
 January 24—February 7—Show, Montreal Can.
 January 24-31—Rochester, N. Y., show.
 January 24-31—Chicago show.
 January 26-31—Scranton, Pa.
 January 31—February 7—Minneapolis show.
 February 2-7—Buffalo passenger car show.
 February 9-14—Buffalo truck show.
 February 16-21—Kansas City show.
 February 18-21—Bloomington, Ill., show.
 February 21-28—Newark, N. J.
 February 22—March 5—Cincinnati, O.
 February 23-28—Omaha show.
 February 24-27—Show, Bloomington, Ill.
 March 2-6—Show, Ft. Dodge, Ia.
 March 7-14—Boston passenger car show.
 March 9-14—Show at Des Moines, Ia.
 March 17-21—Boston truck show.
CONTESTS
 May 30, 1914—Indianapolis 500-mile race.

ing out of the province, and also with visitors here. None of the latter had been serious, although it was a menace nevertheless.

Motorists Plan Turkey Day Run—Plans are now in preparation by the Lu Lu Temple Automobile Club, of Philadelphia, for a run to be held on Thanksgiving day to Hatboro. A stopover will be made at Moore's hotel for dinner, after which the party will run to the Lu Lu Temple country club where they will be entertained by a vaudeville show and dance. The membership of the club is 350.

Women to Judge Amateur Races—Thanksgiving races will be held in New Orleans. This will be a strictly amateur meeting. Races have been arranged for all classes of cars and wide interest is resulting. Prizes are being offered by business men. The judges, timekeepers and all officers having jurisdiction at the races will be women. Prominent society women have promised to fill these places, which insures the social success of the meet.

Texas Favors National Highways—Texas has followed the lead of Ohio, North Carolina, Pennsylvania and West Virginia in demanding that the government build and maintain a system of national highways. At Dallas, last week, the Texas Good Roads Association took action that resulted in its amalgamation with the National Highways Association, of which it has now become the Texas division. By the terms of its regulations it will "urge the adoption of a comprehensive and efficient plan of administration that will improve,

maintain, and unify as one complete system the end that we may secure a national highway system, a state highway system, and a county highway system, each a distinct unit, yet all integral factors of a complete system of good roads everywhere."

Road Builders Meet in December—The convention of the American Road Builders' Association will be held in Philadelphia, December 9 to 13. The meeting will be addressed by Mayor Blankenburg, and among other speakers will be Governor Lister of Washington. There will be an exhibition of road building machinery.

Trailers on Parcel Post Cars—Deliveries of parcel post packages in New Orleans have been facilitated greatly by putting trailers on the regular delivery cars. The parcels were outnumbering the facilities of the regular cars, and to save the expense of buying additional motors, the trailer idea was put in practice. The regulation body of the animal-drawn parcel post wagon was fitted with motor car axles and wheels and coupled to the motor car with street car drawheads.

Sixteen-Valve Car for Bob Burman—A centipede car, specially constructed for the Indianapolis 500-mile race on the motor speedway, is Bob Burman's present hobby. It is called centipede because it possesses sixteen valves, four to a cylinder, two intake and two exhaust. Bob claims that with this multiple arrangement he can get gas into his car and burn it faster than ever before, thereby making speeds of 110 miles an hour

with a 450 cubic inch motor mere child's play. Vanadium steel and phosphor bronze are the component parts of the new space-eater. This is to save a trip into the next county if anything should happen to go wrong, it is said. According to latest reports, Burman hopes to have his new creation done early next spring, in time for an ample tryout prior to the Mémorial day speed carnival.

Two Motor Shows for Hartford—Present indications are that there will be two shows in Hartford, Conn., for the 1914 season. The Hartford Automobile Dealers' Association has not yet come to anything definite other than that a show will be held. Several propositions have been offered the dealers which would entirely relieve them of the actual work of conducting the exhibition and yet enable them to participate in the profits.

Declare War on Crossings—The state public service commission last week ordered the installation of automatic bells at fifteen St. Louis grade crossings. The commission further commands the United Railways, the St. Louis traction company, to place trolley guards at all railroad crossings in the city. The commission's engineer, J. L. Harrop, recommends that the Missouri-Pacific be required to furnish plans and estimates within 4 months for the elimination of the Poplar street line, which runs through the downtown streets. He also recommends the abolishing of other downtown railroad tracks, the city, the railroad company and the United Railways to equally divide the cost of the work.

Recent Incorporations

Fall River, Mass.—J. E. Newton Co., capital stock, \$50,000; to manufacture motor car parts; incorporators, N. R. Gifford, J. E. Newton, F. Crossley.

Hammondsport, N. Y.—J. A. Osborne Mfg. Co., capital stock \$5,000; incorporators, J. A. Osborne, O. Osborne, J. W. Patterson.

LaCrosse, Wis.—LaCrosse Motor Co., capital stock \$10,000; to deal in motor cars, trucks, accessories, etc.; incorporators, F. J. Neetz, W. H. Ristow, B. Lewis.

Muskogee, Okla.—Motor Gasoline Co., capital stock, \$25,000; incorporators, J. M. Givens, E. C. D'Yarmett, W. E. D'Yarmett.

Newark, N. J.—Essex Motors Mfg. Co., capital stock, \$100,000; to manufacture motors; incorporators, W. H. Simpson, N. E. Hudden, J. J. Coyle.

New Orleans, La.—Knuckey-Mysing Auto Co., capital stock, \$10,000; incorporators, W. A. Knuckey, W. F. Mysing and others.

New York—Detroiter Motor Sales Co., capital stock, \$5,000; incorporators, C. Aschenbach, J. Marx, L. Hamburger.

New York—Modern Garage Co., capital stock, \$10,000; incorporators, T. Black, H. W. Biggs, C. S. Flanders.

New York—Leather Tire Goods Co., capital stock, \$7,000; to deal in motor car specialties; incorporators, H. Gurlitt, D. Loebmann, Wm. Loebmann.

New York—Modern Garage Co., capital stock, \$10,000; incorporators, T. Black, C. S. Flanders, H. W. Biggs.

New York—E. H. Garcin & Co., capital stock, \$25,000; incorporators, E. H. Garcin, G. E. Richards, G. S. Fulton.

New York—Hirsch & Schwartz, capital stock, \$10,000; incorporators, J. Schwartz, L. Hirsch, J. Schwartz.

New York—Meyer's Garage, capital stock, \$1,000; incorporators, L. Meyer, J. E. Friel, O. Schult.

New York—Simmons Auto Supply Co., capital stock \$5,000; incorporators, J. S. Kelly, G. W. Lewis, G. W. Smith.

New York—Hirsch & Schwartz, capital stock, \$10,000; motor car business; incorporators, J. Schwartz, L. Hirsch, J. Schwartz.

New York—Charles E. Riess & Co., capital stock \$50,000; incorporators, C. E. Riess, G. L. Riess, B. H. Riess.

New York—Lock Robe-Rail Co., capital stock \$5,000; to manufacture and deal in auto accessories; incorporators, C. W. Crow, W. G. Crichton, R. W. Johnson.

New York—State Auto Repair and Sales Co., capital stock \$5,000; incorporators, R. Kaiser, L. J. H. Schmitt, A. Barnett.

New York—H. Scott Johnson Co., capital stock \$3,000; incorporators, H. S. Johnson, W. A. Hall, A. Kornblum.

New York—N. Brazos Valley Ford Co., capital stock \$3,500; to deal in motor cars; incorporators, M. P. Newnam, H. C. Boatwright, B. M. Barker.

New York—Washington Taxi Service, capital stock \$500; incorporators, H. Rieders, A. Bernstein, J. Brucker.

New York—Mott Haven Garage Co., capital stock \$1,000; incorporators, F. J. Hinners, Katherine Hinners, J. P. Indor.

New York—Pnaufiler Tire Co., capital stock, \$1,000; to deal in tires and tire fillers, etc.; incorporators, F. Eder, H. L. Hill, M. Monfried.

Parkersburg, W. Va.—Market Garage, capital stock, \$25,000; motor cars and supplies; incorporators, E. McCoy, N. V. McCoy, O. D. Strader, C. R. Strader, J. H. Knapp, F. Knapp.

Pittsburgh, Pa.—Artillery Auto-Tire Protector Co., capital stock, \$100,000; incorporators, J. C. Wellington, H. C. May, C. A. Pestil.

Pittsburgh, Pa.—Artillery Auto Tire Protector Co., capital stock \$100,000; to manufacture and deal in protecting devices for tires.

Portland, Me.—Franklin Motor Car Co., capital stock, \$5,000; incorporators, O. A. Lawton, H. D. Cushman, W. M. Chellis.

Rochester, N. Y.—Indian Taxicab Co., capital stock, \$5,000; incorporators, W. S. Lucas, H. F. Lucas, A. B. Lucas.

Rochester, N. Y.—Housel Mfg. Co., capital stock \$2,500; incorporators, W. H. Cole, W. E. Housel, Bernice B. Housel.

Rushville, Ind.—Power Transmission Clutch Co., capital stock \$30,000; to manufacture clutches; incorporators, J. Wiley, O. E. Woodbridge, J. J. Striegel.

San Francisco, Cal.—San Francisco Auto Truck Co., capital stock \$100,000; to manufacture and handle auto trucks; incorporators, J. A. Keenan, W. S. MacLeod, H. Harrington, B. Barbee, J. P. McDonnell.

St. Louis, Mo.—Bond Auto Co., capital stock, \$10,000; incorporators, M. W. Bond, C. Kist, C. Bond.

Tacoma, Wash.—Universal Motor Car Co., capital stock \$25,000; to deal in motor cars; incorporators, W. C. Baldwin, R. A. Mueller, E. M. Baldwin.

Toledo, O.—Carl Electric Vehicle Co., capital stock \$300,000; incorporators, L. M. Henders, M. G. McAlenan, B. E. Robertson, D. L. Johnson, N. C. Myers.

Topeka, Kans.—Jones Auto Exchange Co., capital stock, \$100,000; incorporators, J. J. Jones, L. N. Jones, A. J. Coombs, C. H. Reser, F. C. Adams.

Trenton, N. J.—Asbestos & Rubber Works, capital stock \$50,000; to manufacture asbestos and rubber goods; incorporators, J. H. Souder, J. M. Souder, J. A. Whitney.

Utica, N. Y.—Xardell Bros. Co., capital stock \$20,000; incorporators, J. A. Xardell, C. A. Xardell, W. K. Teeffey.

Valparaiso, Ind.—Wheeler-Elam Co., capital stock, \$15,000; incorporators, W. G. Elam, R. W. Elam, D. S. Wheeler.

Venezuela, S. A.—Maracaibo Transportation Co., capital stock \$135,000; incorporators, M. D. Becerra, F. T. Wanner, L. E. Appleton.

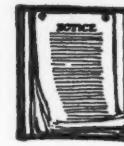
Walterboro, S. C.—Walterboro Garage Co., capital stock \$1,000; incorporators, P. H. Wichman, F. S. Lucas, A. H. Wichman.

White Plains, N. Y.—W. L. Plumb Motor Co., capital stock, \$1,000; motor car business; incorporators, W. L. Plumb, C. B. Plumb, S. A. Ralph.

Winchester, Mass.—Mystic Valley Garage, Inc., capital stock \$25,000; incorporators, N. Goddu, W. Goddu, G. Goddu.



Brief Business Announcements



BOWLING GREEN, O.—James R. Barron of Bowling Green, O., has purchased the Lincoln garage at Delta, O.

Baltimore, Md.—The Baltimore Automobile Dealers' Association has elected B. S. Bliven, Standard Motor Co., Cadillac agency, president; A. Stanley Zell, Zell Motor Car Co., vice-president; and E. R. Myers, Motor Car Co., secretary and treasurer.

Louisville, Ky.—F. S. Cropley, formerly district manager of the United States Tire Co. with headquarters at Minneapolis, Minn., has been appointed manager of the Louisville branch of that concern. H. G. Moesta, who

has been in charge of the local office for more than a year, has been transferred to the New York branch.

Buffalo, N. Y.—W. S. Hill, for several years connected as sales manager here with the Buffalo Hudson Sales Co., has resigned that position to become district manager of the Lippard-Stewart Motor Car Co., his territory covering the eastern states.

Durand, Wis.—A. Vautrot and F. J. Vautrot, local hardware merchants who also operate a garage and repair shop under the name of Vautrot Bros., have decided to divorce the two enterprises and in the future

will conduct the motor car end of the business under the firm name of the Durand Automobile Co.

Coshocton, O.—Twenty-five motor cars were wrecked when the Standard Garage collapsed under the weight of 15 inches of snow on the roof recently, doing damage estimated at \$7,000.

Boston, Mass.—The Henderson Motor Car Co. has just been incorporated in Boston to handle the Henderson line, with James A. Binney as president, and Porter B. Chase as sales manager. Mr. Binney has handled the Henderson in Boston for some time. He has

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

| Town | Agent | Make | Town | Agent | Make |
|---------------------|------------------------------------|---------------|---------------------|------------------------------------|------------------------|
| Altoona, Pa. | Mountain City Motor Co. | Oakland | Gowrie, Ia. | Gowrie Auto Co. | Oakland |
| Allentown, Pa. | Wink Motor Car Co. | Haynes | Hilliards, O. | Leroy Dobyns | Ford |
| Azalea, N. C. | W. B. McEwen | Haynes | Herndon, Pa. | Herndon Motor Co. | Oakland |
| Albany, N. Y. | C. F. Weeber Mfg. Co. | Haynes | Hutchinson, Minn. | W. W. Sivright | Jeffery |
| Anderson, Ind. | Hill State Co. | Jeffery | Hanlontown, Ia. | J. O. Kaasa | Oakland |
| Aurora, Ill. | Geo. W. Smart | Jeffery | Harrison, N. J. | T. J. Butler | Haynes |
| Assumption, Ill. | C. R. Heiserman | Partin-Palmer | Harvard, Ill. | Manley Hdw. Co. | Haynes |
| Ashtabula, O. | Wicks & Donley | Crow | Hartford, Conn. | Roswell J. Clapp | Haynes |
| Ardmore, Pa. | Mahan's Garage | Jeffery | Hudson Falls, N. Y. | Empire Garage Co. | Haynes |
| Amsterdam, N. Y. | W. H. Bell | Jeffery | Hurlock, Md. | W. C. Bradley & Son | Jeffery |
| Akron, O. | C. W. Rodrick | Crow | Hutchinson, Kan. | L. W. Eaton | Jeffery |
| Boscobel, Wis. | O. M. Mathison | Crow | Havana, Cuba | Andres Diaz Pairo | Jeffery |
| Bradford, N. H. | F. H. Messer | Jeffery | Hamilton, Ont. | Smith, Stacher & Feeder Co. | Partin-Palmer |
| Bradgate, Ia. | B. H. Berger Co. | Oakland | Houston, Tex. | L. O. Brown | Partin-Palmer |
| Belleville, Ill. | Geo. Eidman Implement Co. | Jeffery | Hickory, Pa. | Ross Motor Car Co. | Moon |
| Brooklyn, N. Y. | Putnam Motor Car Co. | Moon | Iowa Falls, Ia. | W. G. Gohring | Oakland |
| Bucksport, Pa. | J. T. Mooney & Son | Moon | Indianapolis, Ind. | Allen Motor Sales Co. | Allen |
| Brookfield, Mo. | G. F. Evans | Partin-Palmer | Jersey City, N. J. | J. J. Wacker | Haynes |
| Bethany, Mo. | B. P. Sigler | Crow | Jacksonville, Fla. | Mangels-Kirby Co. | Jeffery |
| Bloomingdale, O. | Blackburn Bros. | Crow | Janesville, Wis. | J. A. Strimple | Crow |
| Buffalo, N. Y. | Geo. Schuster Garage & Sales Co. | Crow | Kewanee, Ill. | Lyle H. Smith | Haynes |
| Bentonville, Ind. | Ray Thornberg | Oakland | Kingston, N. Y. | Kittanning, Pa. | Moorhead Motor Car Co. |
| Bartlesville, Okla. | S. C. Brady | Oakland | Lewiston, Mont. | F. J. Robinson | Jeffery |
| Buffalo Center, Ia. | J. F. Buggy | Oakland | Lowell, Mass. | A. J. Cumiskey Motor Car Co., Inc. | Partin-Palmer |
| Britt, Ia. | Castle & Co. | Oakland | Leeksburg, Ill. | J. L. Clayton | Moon |
| Bancroft, Ia. | J. H. Devlin | Oakland | Louisville, Ky. | F. G. Mohn | Reid Auto Co. |
| Brooklyn, N. Y. | I. C. Kirkman | Haynes | Logansport, Ind. | Oakland Sales Co. | Oakland |
| Berlin, Conn. | Berlin Auto Co. | Haynes | Lebanon, Pa. | Lebanon Auto & Garage Co. | Oakland |
| Brookville, Pa. | L. A. Leathers Co. | Jeffery | Lone Rock, Ia. | E. C. Bell | Oakland |
| Brookfield, Mo. | Byron K. Newcomb | Oakland | Laurens, Ia. | McAtee & Sons | Oakland |
| Bridgeport, Conn. | Peck & Lines Co. | Haynes | LeMoore, Cal. | Hancock & Meyer | Haynes |
| Coloma, Mich. | William Umphrey | Crow | Lindsay, Cal. | D. O. Bishop | Lancaster, Pa. |
| Columbia, Mo. | West & Vanatta | Jeffery | Los Agtos, Cal. | Samuel K. Landis | Haynes |
| Charleston, S. C. | Wallace K. Harley | Jeffery | Leipsic, O. | W. H. Main | Haynes |
| Collinsville, Ill. | Bernhardt-Niehaus & Co. | Jeffery | Lena, Ill. | H. H. Townsend | Jeffery |
| Centralia, Kan. | E. F. Norris | Jeffery | Little Rock, Ark. | H. R. Nelson | Jeffery |
| Cincinnati, O. | John Rempe & Co. | Partin-Palmer | Leland, Ill. | J. T. Lloyd Co. | Jeffery |
| Crete, Ill. | William Seggebruch | Partin-Palmer | Lynn, Mass. | Jonas Sawyer | Jeffery |
| Centralia, Ill. | Centralia Garage & Vulcanizing Co. | Partin-Palmer | LaMolle, Ill. | F. M. Plumstead & Son | Jeffery |
| Columbus, O. | G. E. Thomas Co. | Maxwell | La Crosse, Wis. | Geo. Wendell & Son | Jeffery |
| Columbus, O. | Kaiser Motor Car Co. | Hupmobile | Lima, O. | C. H. Holway | La Plate, Ill. |
| Columbus, O. | Jacob Renner | Ford | La Plate, Ill. | Shappel Bros. | Partin-Palmer |
| Columbus, O. | Partin-Palmer-Columbus Co. | Partin-Palmer | LeRoy, N. Y. | H. I. Sears | Crow |
| Cynthiana, Ky. | Cynthiana Carriage Co. | Chevrolet | Lanesboro, Minn. | Thomas Watson | Crow |
| Cobleskill, N. Y. | W. H. Fox | Pullman | Minneapolis, Minn. | G. J. McMaster | Jeffery |
| Crisfield, Mo. | L. S. Nock | Crow | Marengo, Ill. | Alex R. Curtis | Crow |
| Charleston, Ill. | Thos. Prendergast | Oakland | Madera, Cal. | J. H. Patterson | Jeffery |
| Clare, Ia. | Wm. Fox | Oakland | Milford, Del. | Sledge & Reed | Haynes |
| Corning, Pa. | Job B. Lukens | Haynes | Manistee, Mich. | W. I. Cirwither | Oakland |
| Cresson, Pa. | Conrad Bros. | Jeffery | Miami, Fla. | C. G. Bigge | Oakland |
| Cheldon, Ill. | Chas. Bowen | Crow | Martinton, Ill. | J. K. Dorn | Oakland |
| Clinton, Ind. | Clinton Auto Co. | Haynes | McDonald, Pa. | W. E. Davis | Oakland |
| Cleveland, O. | W. H. Barger Co. | Jeffery | Moline, Ill. | McDonald Auto Co. | Haynes |
| Cyrus, Minn. | H. C. Estby | Jeffery | Middletown, N. Y. | Williams McClean Garage | Haynes |
| Dayton, Ia. | Burnquist Hdw. Co. | Oakland | Mason City, Ia. | Empire Garage | Haynes |
| Dover, Del. | Dover Garage Co. | Oakland | Manteno, Ill. | F. E. Wall | Jeffery |
| Des Moines, Ia. | Lagerquist Carriage & Auto Co. | Haynes | Memphis, Tex. | O. C. Shreffler | Jeffery |
| DeGroff, Minn. | John J. Byrne | Jeffery | Morgantown, W. Va. | C. L. Sloan | Jeffery |
| Des Moines, Ia. | Des Moines Rambler Co. | Jeffery | Manchester, N. H. | E. J. McIntire | Jeffery |
| DePere, Wis. | DePere Motor Car Co. | Partin-Palmer | Macomb, Ill. | W. D. Faires | Jeffery |
| Dodge, Neb. | A. Schlosser | Jeffery | Minneapolis, Minn. | P. J. Downes Co. | Jeffery |
| Englewood, N. J. | Stillman & Hoag | Haynes | Minden, Neb. | Lars Gunderson | Jeffery |
| Elmira, N. Y. | T. Wrayburn Keeton | Jeffery | Manitowoc, Wis. | Olsen-Hemming Auto Co. | Jeffery |
| Fulton, N. Y. | R. D. Piper | Haynes | Monroe, Wis. | Walter Spindler | Jeffery |
| Ft. Dodge, Ia. | Hanson & Tyler Auto Co. | Jeffery | Maple Park, Ill. | Monroe Auto Co. | Partin-Palmer |
| Fremont, Neb. | A. Keyen | Moon | Mitchell, S. D. | Western Auto Co. | Partin-Palmer |
| Frankfort, Ind. | G. D. Milner | Jeffery | Monessen, Pa. | Monessen Plumbing & Electric Co. | Moon |
| Fairbury, Ill. | W. D. Spence | Crow | Manchester, N. H. | Firestone Garage | Pullman |
| Foosland, Ill. | G. A. DeLong | Jeffery | Morrisstown, N. J. | Borrean & Borrea | Pullman |
| Franklin, Pa. | Myers Carriage Co. | Jeffery | Minneapolis, Minn. | Choate Auto Repair Co. | Mercer |
| Greenwood, Miss. | Kimbrough Auto Co. | Haynes | Montreal, Que. | Leger & St. Pierre | Partin-Palmer |
| Greenville, Miss. | G. G. Alexander | Haynes | Newton, Kan. | Newton Garage & Auto Co. | Oakland |
| Genesee, Ill. | E. F. Dilenbeck | Jeffery | Newman, Cal. | J. K. Kinnear | Oakland |
| Goodhue, Minn. | Davis & Johnson | Jeffery | Northwood, Ia. | I. O. Kasa | Oakland |
| Girard, Ill. | G. G. Garretson | Partin-Palmer | New Haven, Conn. | Lawrence R. Howleshield | Haynes |
| Gardner, Ill. | Wagner & Root | Partin-Palmer | Newark, N. J. | Haynes Auto Co. | Haynes |
| Gillett, O. | Nicholas Stromer | Crow | | | |
| Georgetown, Del. | Thomas R. Purnell | Jeffery | | | |
| Gibbon, Minn. | Johnson & Johnson | | | | |

moved from Boylston street to a new building at 62 Brookline avenue, near the American League baseball park.

Portland, Ore.—Archie V. Davis, Northwest representative of the Maxwell Motor Co., died unexpectedly in Portland, Ore., recently as the result of heart disease. Mr. Davis was well known in Detroit, having been in Portland only since last April.

Crandon, Wis.—Sidney Raymond of North Crandon, Wis., has purchased the garage and business of Carter Bros. at Crandon and several lots adjoining, upon which he proposes to build a large addition, to include a repair shop and new display rooms.

Sheboygan, Wis.—August H. Prange has purchased the Erie Garage Co. of Sheboygan, Wis., and has moved his garage and sales business into the Erie garage on North Ninth street. The old Prange garage on North Seventh street will be abandoned. The

Erie Garage Co. represented the Rambler, Paige and Speedwell, but the agencies are not taken over by Mr. Prange.

Boston, Mass.—A. C. Bunker, who has been associated with the motor car industry for several years, has just bought an interest in the Cole Motor Co. of Boston and has been appointed general manager of the company.

St. Louis, Mo.—The Olds Motor Works of Lansing, Mich., which has maintained the Oldsmobile Co. of Missouri as its local branch, has closed the local agency. Hereafter O. Gratiot Cabanne, former Olds manager, will handle the Olds car in the St. Louis territory.

Waukesha, Wis.—The Resthaven Garage, Hartwell and Arcadian avenues, Waukesha, Wis., has been leased by the Spring City Auto Co., a partnership among E. A. Spinner of Milwaukee; P. J. Wolf and W. H. Evans of Menomonee Falls, who will handle the Ford and do a general garage and repair business.

The garage is associated with Resthaven hotel, a large summer and winter resort.

New York—The New York branch of the Stromberg Motor Devices Co. has been moved from 1926 Broadway to 146 East Fifty-sixth street. The new address was given incorrectly in last week's issue of Motor Age.

Louisville, Ky.—F. H. Peabody, of Boston, Mass., is the new manager of the Louisville branch of the Ford Motor Co., succeeding F. E. Van Patton. Mr. Peabody formerly was assistant manager of the Boston Ford branch.

Baltimore, Md.—Reus Bros. & Co. has been formed to deal in motor specialties and the manufacture of motor parts. The company is composed of Burkhard Reus, John F. Reus, Jr., and S. Wilson Morrow, all formerly of the Carl Sporer's Sons Co. The firm is erecting a new building on Mt. Royal avenue and Cathedral street.

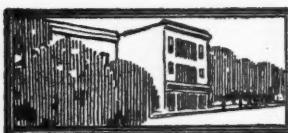
Recent Agencies Appointed by Motor Car Manufacturers—Continued

PASSENGER CARS

| Town | Agent | Make | Town | Agent | Make |
|----------------------|---------------------------------|----------------|--------------------------|---------------------------------|----------------|
| New London, Ia. | Murray Bros. | Haynes | Seaford, Del. | Leon S. Hurley | Jeffery |
| North Yakima, Wash. | Levi Z. Kass | Jeffery | Salisbury, Mo. | Stampfer & Shannon | Jeffery |
| Nashville, Wis. | F. J. Rogers | Bulck | Streator, Ill. | Geo. M. Loy | Jeffery |
| Newark, Del. | Newark Garage | Haynes | St. Marys, Pa. | George Wolf | Jeffery |
| Nashville, Wis. | F. J. Rogers | Henderson | Schuylerville, Neb. | Schuylerville Motor Co. | Jeffery |
| New Hampton, Ia. | Leichtman Motor Car Co. | Crow | Sterling, Ill. | Thackaberry & Son | Jeffery |
| Olathe, Kan. | Olathe Auto Co. | Oakland | Somerset, Wis. | John Pearson | Jeffery |
| Orange, Cal. | M. Eltiste & Co. | Oakland | San Francisco, Cal. | Jeffery Auto Sales Co. | Jeffery |
| Ottumwa, Ia. | Aapello Auto Co. | Haynes | Sheboygan, Wis. | W. A. Knaak Motor Co. | Jeffery |
| Oshwosh, Wis. | Doman Motor Car Co. | Jeffery | San Antonio, Tex. | C. F. Tinnin | Partin-Palmer |
| Peabody, Mass. | Renzi Garage Co. | Oakland | Salt Lake City, Utah | J. P. Fowler Mfg. Co. | Chevrolet |
| Phillipsburg, N. J. | Geo. W. Kiefer | Oakland | Salem, N. J. | E. H. Davis | Pullman |
| Princeton, Ind. | Stevens Auto Co. | Oakland | Springfield, Mass. | Hampden Auto Co. | Pullman |
| Pocahontas, Ia. | Miller & Nelson | Oakland | Seattle, Wash. | Metropolitan Motor Car Co. | Seattle, Wash. |
| Pittsfield, Mass. | Case & Elleman | Haynes | Smithfield, O. | J. J. Schrock | Crow |
| Providence, R. I. | J. T. Stubbs | Haynes | St. Louis, Mo. | C. Gratiot Cabanne | Oldsmobile |
| Pomona, Cal. | Arthur L. Wood | Haynes | South Whitley, Ind. | W. Bowdy & Son | Crow |
| Parkersburg, W. Va. | Market Garage & Machine Co. | Haynes | South Bend, Ind. | Harry E. Coil | Crow |
| Penn Yan, N. Y. | Wegener Bros. | Jeffery | Toulon, Ill. | F. E. Cole | Crow |
| Pittsburgh, Pa. | L. G. Martin | Jeffery | Toledo, O. | Bacon Bros. | Pullman |
| Pax Christian, Miss. | Elmer Northrop & Co. | Jeffery | Table Grove, Ill. | Harry Foster & Son | Haynes |
| Poplar Bluff, Mo. | E. C. Morrison | Jeffery | Thief River Falls, Minn. | Tessum Feed, Grain & Supply Co. | Jeffery |
| Plymouth, Wis. | Deicher & Arndt | Partin-Palmer | Troy, O. | Jones & McConnell | Jeffery |
| Pitman, N. J. | Fenton J. Sayre | Mitchell-Davis | Taylorville, Ill. | H. F. Richmond | Partin-Palmer |
| Philadelphia, Pa. | Wauning-Paxton Motor Co. | Crow | Tiffin, Mo. | Zener Bros. | Crow |
| Pawnee, Ill. | Ideal Garage | Haynes | Utica, N. Y. | G. M. Redding | Haynes |
| Plattsburgh, N. Y. | Princeton Auto Supply Co. | Crow | Van, Pa. | O. E. Kelly | Crow |
| Princeton, Ky. | Joseph DeVarennes | Jeffery | Viola, Ill. | Fraker & Ashenurst | Crow |
| Quebec, P. Q. | W. F. Lester | Crow | Velva, N. D. | Edward Gilbertson | Crow |
| Quincy, Fla. | F. M. Lee | Jeffery | Vancouver, B. C. | H. J. Tucker | Abbott-Detroit |
| Roseville, Ill. | Burnette & Chapman | Crow | Vancouver, Wash. | Sparks Supply Co. | Jeffery |
| Rocky Mount, N. C. | G. W. Hennen | Crow | Vallejo, Cal. | Vallejo Carriage Works | Haynes |
| Rochester, N. Y. | B. A. Blenner | Chandler Six | Waterville, Minn. | C. W. Christman | Jeffery |
| Richmond, Va. | Ed. Anderson | Oakland | Waupun, Kan. | Anderson Bros. | Oakland |
| Ruthven, Ia. | White Bros. | Oakland | Wallingford, Ia. | A. O. Kasa | Oakland |
| Rolfe, Ia. | Sears Auto & Supply Co. | Oakland | Waterloo, Ia. | Hileman Motor Car Co. | Haynes |
| Rome, N. Y. | John Pearson | Haynes | Wainscott, L. I., N. Y. | Frank J. Hedges | Haynes |
| Rockford, Ill. | Joslyn Auto Co. | Haynes | Williamsport, Pa. | W. N. Mussina | Jeffery |
| Ridgely, Pa. | L. B. S. Shaw | Haynes | White Plains, N. Y. | Tri State Supply Co. | Haynes |
| Roscoe, Minn. | Western Minnesota Auto Co. | Crow | Worcester, Mass. | J. C. Harvey | Haynes |
| Rushville, Ill. | Rushville Auto Sales Co. | Crow | Washington, C. H., O. | Moore & Jamison | Jeffery |
| Rosedale, Tex. | B. Ashby | Moon | Winnebago, Minn. | E. O. Gulbranson | Jeffery |
| Reedsburg, Wis. | Piepenburg & Rechert | Partin-Palmer | Wheeling, W. Va. | H. M. Bratton | Jeffery |
| Redwood Falls, Minn. | Foss & Sorge | Jeffery | Wood Lake, Minn. | W. O. Dillingham | Jeffery |
| St. Louis, Mo. | John Pearson | Jeffery | Woonsocket, R. I. | H. F. Burdick | Jeffery |
| Saginaw, Mich. | George C. Brikman Motor Car Co. | Lyons-Atlas | Winona, Minn. | Nic Steffes | Jeffery |
| Stanhope, Ia. | G. E. Seelwy Co. | Oakland | Westfield, Wis. | Schauer Bros. | Jeffery |
| Santa Cruz, Cal. | Craig-Olson Co. | Oakland | Waternottown, Wis. | Copeland-Roach Motor Co. | Jeffery |
| San Bernardino, Cal. | Hubbs & Brisaac | Haynes | Waukesha, Wis. | Baumgardner Bros. | Partin-Palmer |
| Scranton, Pa. | H. F. Gausner | Haynes | Vancouver, B. C. | Spring City Auto Co. | Ford |
| Souderton, Pa. | Peter Ebyrent | Haynes | Vernon, Tex. | Kerner Bros. | Crow |
| Summit, N. J. | E. H. Stover | Haynes | Weyacoona, Mo. | N. F. Nelson | Crow |
| Sabilla, Ia. | E. F. Anderson | Haynes | Winthrop, Minn. | C. W. Lowe | Haynes |
| Salt Lake City, Utah | Snow Automobile Co. | Jeffery | Yonkers, N. Y. | Wallace & Keefer | Partin-Palmer |
| Sioux City, Ia. | Wright Motor Car Co. | Jeffery | Youngwood, Pa. | W. T. Barnes | Jeffery |
| | Rambler Distributing Co. | Jeffery | Zanesville, O. | | |

COMMERCIAL CARS

| Town | Agent | Make | Town | Agent | Make |
|----------------------|--------------------------|----------|---------------------|--|-----------------|
| Abilene, Tex. | Blake Dellingier | Chase | Mineral Wells, Tex. | Peake & Loflin | Chase |
| Abilene, Tex. | W. H. Childers | Chase | McKinney, Tex. | C. J. Smith | Chase |
| Atlantic City, N. J. | Eastern Motor Car Co. | Republic | Palmyra, N. J. | C. F. Knuth | Republic |
| Binghamton, N. Y. | Binghamton Motor Car Co. | Republic | Richmond, Va. | B. A. Blenner | Lippard Stewart |
| Baltimore, Md. | H. Darwin Howell | Best | Richardson, Tex. | W. E. Dean | Chase |
| Corsicana, Tex. | Hooser & Colquitt | Chase | St. Louis, Mo. | Meyer Motor Co. | Speedwell |
| Decatur, Tex. | W. B. Man | Chase | St. Louis, Mo. | Meyer Motor Co. | Brown |
| Denton, Tex. | Taylor Hdw. Co. | Chase | St. Louis, Mo. | Meyer Motor Co. | Diamond T |
| Forney, Tex. | J. T. Dozier | Chase | Tiffin, O. | Raymond W. Miller and J. Ralph Summers | Krebs |
| Ferris, Tex. | L. W. Jones | Chase | Thornton, Tex. | J. P. Walling | Chase |
| Grand Saline, Tex. | Griggers & Simpson | Chase | Vancouver, B. C. | H. J. Tucker | Federal |
| Greenville, Tex. | O. T. Engleman | Chase | Vernon, Tex. | E. L. Ladd | Chase |
| Gainesville, Tex. | W. L. Greenhill | Chase | Wichita Falls, Tex. | J. Madison Hdw. & Imp. Co. | Chase |
| Guadalupe, Tex. | R. L. Lucas | Chase | Whitewright, Tex. | Lloyd Moore | Chase |
| Hillsboro, Tex. | Hillsboro Garage | Chase | Waco, Tex. | J. Morgan Automobile Co. | Chase |
| Irving, Tex. | C. L. Littlepage | Chase | Weatherford, Tex. | Quick Service Garage | Chase |
| Jacksonville, Tex. | J. L. Newson | Chase | Wortham, Tex. | Speed & Weidner | Chase |
| Kaufman, Tex. | G. C. Smith | Chase | Windom, Tex. | Claude Dowlen | Chase |
| Midland, Tex. | McClelland & Phillips | Chase | | | |



Among the Makers and Dealers



STANDARD Truck Capital Increased—The Standard Truck Co. of Cleveland, O., has filed papers with the secretary of state increasing its capital stock from \$5,000 to \$50,000.

To Direct Accessory Sales—L. C. Flaherty, salesman for the C. A. Shaler Co. for several years, has resigned, to take the position as sales manager for the Adamson Mfg. Co., of East Palestine, O., manufacturer of vulcanizers and other motor car specialties.

Promotion for Motz Branch Manager—J. V. Harding, formerly Detroit branch manager of The Motz Tire and Rubber Co., is now special representative for this concern. He will retain his headquarters in Detroit, as his duties will be principally with the manufacturers of the immediate territory.

No Speedometers on Ford Cars—The Ford Motor Co. of Detroit announces that for the present its cars will not be equipped with speedometers, the officials claiming that they cannot secure a satisfactory instrument. An allowance of \$6 will be made purchasers on cars not equipped with speedometers.

To Exhibit Top at Olympia Show—For the purpose of exhibiting the Sharer one-hand top at the Olympia show and to dispose of the European rights for this top, James M. Carples sailed recently for London. Several European makers have evinced an interest in Sharer's invention and may adopt it.

Midland Stock Moved to Philadelphia—The entire stock of repair parts, together with all drawings, jigs, patterns, special tools and records of the Midland Motor Co. has been moved from the plant at Moline, Ill., to the Philadelphia factory, 2200-2218 Diamond street, where a service station has been established.

Cassidy to Direct J-M Sales—Edward A. Cassidy, until recently a member of the firm of Petry-Cassidy, Inc. of Philadelphia, has been appointed sales manager of the motor car accessory division of the H. W. Jones-Manville Co. of New York, which recently took over the Jones speedometer manufacture and sales.

Jeffery Names New York Agent—Gilbert M. Stratton, for the past 8 years Pope-Hartford dealer in New York and Brooklyn, has been appointed Greater New York representative by the Thomas B. Jeffery Co. of Kenosha. He will operate under the name of the Stratton Motor Car Co. This is the first of the large Jeffery's agencies to be appointed on the Atlantic seaboard.

Plew Heads Devices Company—James E. Plew, formerly Chicago agent for the White, has been elected president of the Motor Devices Co. of Chicago, recently incorporated to manufacture and market the Webb Jay automatic suction primer and the Webb Jay auxiliary tank. The other officers of the company, which has opened offices at 2635 Wabash avenue, are Webb Jay, vice-president; Robert M. Cutting, treasurer, and J. T. Swigert, secretary.

Additions to Knight Tire Plant—Work has started by the Knight Tire and Rubber Co. of Canton, O., on buildings which will more than double the capacity of the plant. The buildings will be erected adjacent to the present plant. There will be two buildings, 75x125 feet, three stories high, and one building 55x125 feet, two stories high. All will be of reinforced concrete and absolutely fire-proof. The floors of concrete will be built to withstand a test strain of 250 pounds to

the square foot. The daily capacity of the plant will be 500 tires and 700 tubes a day. The improvements will cost \$110,000.

Buys Schacht Motor Plant—E. H. Huenfeld, a manufacturer of Camp Washington, has purchased the Cincinnati plant, formerly occupied by the Schacht Motor Car Co., for \$17,350.

Smeets Joins Billings-Chapin Co.—M. A. Smeets, formerly with Power Boating, has succeeded Lloyd W. Young as advertising manager of the Billings-Chapin Co. of Cleveland, O., manufacturer of motor car paints and varnishes.

Worthen with Canadian Company—W. K. Worthen, formerly factory representative of the Knight Tire and Rubber Co. in the northwest territory, has accepted a position as business manager of the Compressed Gas Co. of Vancouver, B. C.

Stevens Patent Is Upheld—A permanent injunction, in favor of Stevens & Co., New York motor car specialties manufacturer, has been granted by the United States district court against Bernard Morgan in the patent infringement suit covering the Bryant valve spring remover.

Briscoe Offices in New York—The firm of Briscoe Freres, Benjamin Briscoe's French company, has moved its main offices from Billancourt, Paris, to 7 East Forty-second street, New York. Mr. Briscoe and James Guthrie will sail for America at the close of the London show for the purpose of starting work in this country.

Big Sales Gain for Moon—The trend of the trade and the demand for light sixes is reflected in the announcement of the Moon Motor Car Co. of St. Louis which reports a 52 per cent gain in actual shipments of bona fide sales from the factory for August, September and October over the same months of last year. Practically all the gain is on the light six.

Contract Let for Ford Branch—The Ford Motor Co. of Detroit has awarded the contract for the erection of the large assembling plant on Cleveland and Buckingham avenues, Columbus, O., to the National Fireproofing Co. of Pittsburgh for \$156,000. This is exclusive of the plumbing, heating and electrical systems. The contracts for that work will be awarded later. It is expected to have the plant ready for occupancy in the spring. The plant consists of a four-story building more than 200 feet in length.

Former Jeffery Official Dies—Word has been received at Kenosha, Wis., that Robert E. Wilkinson, formerly associated with the Thomas B. Jeffery Co. of Kenosha, Wis., and more recently district agent for the White at Mandan, N. D., died as the result of injuries received in accident. Mr. Wilkinson was 47 years old. He was manager of the Kenosha Gas Co. for many years, resigning to join the sales department of the Jeffery company. Later he went west for the White Co.

Stephenson Assets Exceed Liabilities—The Stephenson Motor Truck Co. of South Milwaukee, Wis., has filed schedules of its assets and liabilities in the proceedings brought by creditors to adjudicate the corporation bankrupt. Assets are given at \$37,306.82 and liabilities at \$15,576.77. The company several months ago lost its suit against the J. I. Case T. M. Co. of Racine for \$150,000 damages on charges of breach of contract and thereafter discontinued operation of its plant because its selling organization was disintegrated,

having been dropped after the Case company took over its output for a certain period with an option to purchase the plant.

Metropol Wheelbase 135 Inches—Due to a typographical error in the November 6 issue of Motor Age, the wheelbase of the Metropol was given as 115 inches instead of 135 inches.

To Establish Agency in Bombay—Amos White, formerly secretary of the Everett Auto Sales Co. of Columbus, O., will sail early next month from New York for Bombay, India, where he will establish a concern for the purpose of selling and distributing American-made motor cars.

Four Firms Join M. and A. M.—The following concerns have been elected to membership in the Motor and Accessory Manufacturers: Overman Tire Co. of New York, the Bossert Co. of Utica, N. Y., the Waltham Watch Co. of Waltham, Mass., and the Wagner Electric Mfg. Co. of St. Louis.

Nine-Year-Old Suit Dismissed—The case of the Whitney Motor Wagon Co. vs. The Prescott Automobile Mfg. Co., which has been running in the United States District Court for the Southern District of New York since 1902, has been dismissed without costs to either party.

Cadillac Breaks Production Record—Two thousand and sixteen 1914 Cadillacs were manufactured and shipped during the month of October, 1913. Out of this number 1,828 were of the open body styles and 188 were closed cars, all types of Cadillacs being represented. The retail selling value of these cars is \$4,246,425. This is said to be a production record for 1 month.

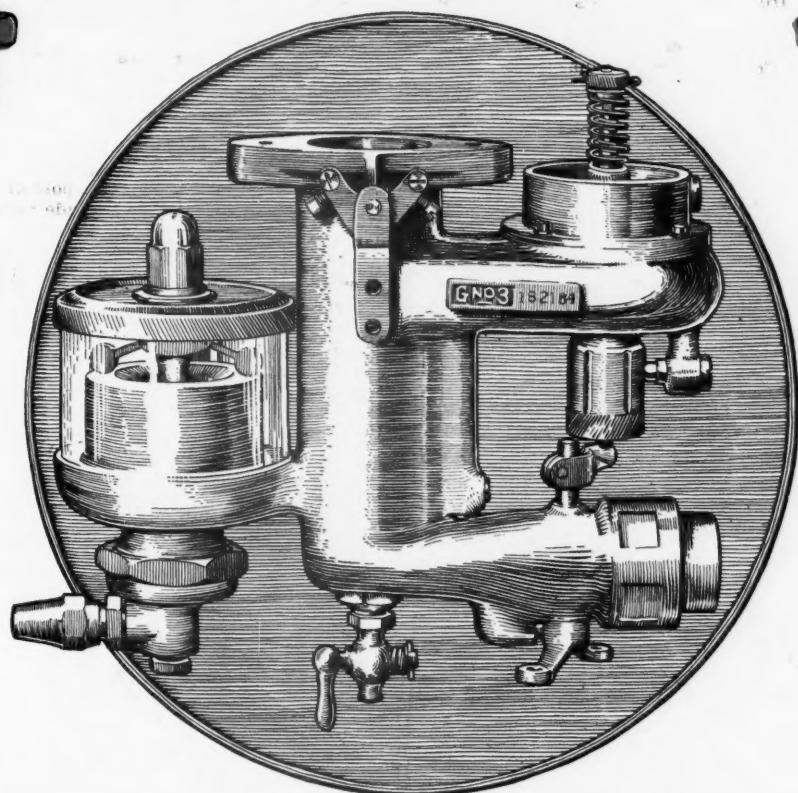
Toronto Tire Company Prosperous—The Independent Tire Co. of Toronto, Canada, issues a statement reporting net earnings for October "equal to a dividend of 30 per cent on the total paid-up capital, and the factory has not yet reached half of its maximum output." The factory, which has a capacity of 500 tires a day, has been in operation since the beginning of the summer.

Fire Destroys Body Plant—Fire last week destroyed the plant of Powitsky and Collins, manufacturers of carriages and motor car bodies at St. Louis, Mo. The damage, according to President Frank H. Powitsky, is \$270,000, fully covered by insurance. While returning from the fire Fire Chief Swingley's motor car crashed into another vehicle, wrecking both machines.

New Motor Makers Organize—Stockholders in the Augustyn Rotary Valve Engine Co. of Marshfield, Wis., have effected a permanent organization by the election of the following officers: President, Dr. G. L. Harrington; vice-president, Charles K. Herrick; secretary, Henry E. Hoerl; treasurer, R. J. Strauss; directors, Edward Augustyn, Frank Trudeau and John McDonnell. No definite plans for the production of the new motor have been made as yet, but the promoters are at work on the proposition of establishing a plant.

Waterman Leaves Harvester Company—Henry A. Waterman, general superintendent of the Milwaukee works of the International Harvester Co., and in charge of design and experimental work on tractors and internal combustion engines, has resigned to become general manager of operations for the M. Rumely Co., Laporte, Ind., in charge of all of its numerous works. Mr. Waterman is a graduate of Boston Tech and served 3 years as engineer for the Browne and Sharpe Mfg. Co. at Providence before engaging with agricultural machinery manufacturing companies.

*Judge Its Quality by the
Company It Keeps*



STROMBERG CARBURETOR

"The Accepted Standard"

Stromberg Motor Devices Company

54 E. 25th Street, Chicago, Ill.

Branches: NEW YORK BOSTON DETROIT INDIANAPOLIS MINNEAPOLIS

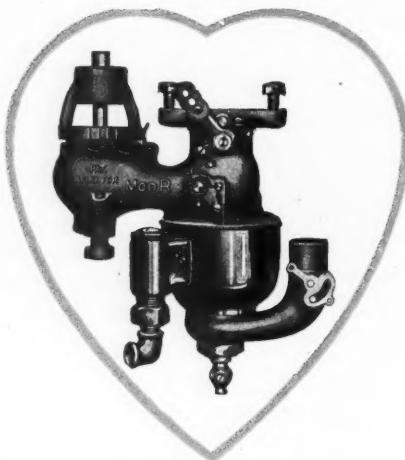
Pacific Coast Distributors: Chanslor & Lyon Company, Los Angeles, Portland, Fresno, Spokane, San Francisco, Seattle
Canadian Distributors: Russell Motor Car Company, Toronto, Montreal, Hamilton, Winnipeg, Calgary, Vancouver

When Writing to Advertisers, Please Mention Motor Age.

Schebler

Model
R

1914



Carburetor

Correct in principle
Simple of adjustment
Automatic in action

Sure starting
Greater power and speed
Better economy

WHEELER & SCHEBLER, Indianapolis, Ind.

"Pioneers in Perfection of Carburetion"

BRANCHES:

| | | | |
|--------------------------------------|--------------------|-------------------------|------------------|
| FRY & MCGILL MOTOR SUPPLY CO..... | Denver, Colo. | WHEELER & SCHEBLER..... | Chicago |
| AUTOMOBILE ACCESSORIES CO..... | Pittsburgh, Pa. | WHEELER & SCHEBLER..... | Detroit |
| FERRIS-DUNLAP AUTO SUPPLY CO..... | Dallas, Tex. | FRED CAMPBELL..... | St. Louis, Mo. |
| INTERSTATE ELECTRIC CO..... | New Orleans, La. | W. J. CONNELL..... | Boston, Mass. |
| REINHARD BROS. CO..... | Minneapolis, Minn. | EQUIPMENT CO..... | Kansas City, Mo. |
| MANUFACTURERS' SUPPLY CO..... | Philadelphia, Pa. | ELYEA-AUSTELL CO..... | Atlanta, Ga. |
| WEINSTOCK-NICHOLS CO..... | Los Angeles, Cal. | J. C. NICHOLS..... | New York City |
| PENNSYLVANIA RUBBER & SUPPLY CO..... | Cleveland | WEINSTOCK-NICHOLS..... | San Francisco |

FAIRBANKS, MORSE & CO., Ltd., London, England
CANADIAN FAIRBANKS-MORSE CO. (All principal Canadian Cities)

Take a common office or pantry "buzzer"

—put a case around it, attach a sounding board and a projector and you have an "electric horn."

When the car maker or car agent refers to the signal in the equipment as "electric horn," nine times out of ten that signal is of just this construction.

This "buzzer" or "vibrator" horn is the cheapest electrically operated signal possible to make. Its note is a nasal, droning buzz—often even less powerful than the old bulb-horn.

The diaphragm producing the note is vibrated by an electric spark between two points. Unless these are made of platinum iridium, the cost of which is prohibitive, they soon wear down and the horn won't sound.

We know. We have tested buzzer horns—all kinds of buzzer horns. Before the Klaxon was invented, we considered manufacturing buzzer horns. We to-day own the patent of the best buzzer horn we have ever seen.

IF a car is Klaxonized, the makers and agents always say "Klaxon." They have paid from two to eight times more for signal equipment in order that they CAN say "Klaxon."



Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

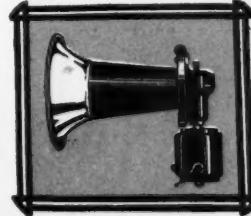
KLAXON
"The Public Safety Signal"

KLAXONET

This advertisement planned, written and set up entirely in the Klaxon Factory. Type composition by the Klaxon Press with "Klaxon" type especially designed by Goudy.

Klaxonized Cars

A. E. C.
Alco
Armleder
H. H. Babcock
Benz
Borland Electric
Broc Electric
Buffalo Electric
Roadster
Century Electric
Charon (European)
Chicago Electric
Clark
Columbia
Croxton
Davis
F. I. A. T.
Havers "Six"
Jeffrey
King
Kissel
Knickerbocker
Knox
Lancia (European)
Lenox
Locomobile
Lozier
Luverne
Marmon
Matheson
Maxwell "Six"
Mercedes
Metallurgique
Mors (European)
Multiplex
National
Nyberg
Oakland
Ohio "Six"
Old Reliable
Oldsmobile
Oxford
Packard
Peerless
Peugeot
Pierce-Arrow
Pope-Hartford "Six"
Pratt
Sayers & Scovill.
S. & M. "Six"
Schneider (European)
S. G. V.
Simplex
Staford
Staver
Stearns
Sternberg
Stevens-Duryea
Stoddard-Dayton
Touraine
Walker Electric
Ward
White
Winton



KLAXON

This "Six" challenges comparison

Among keen judges of automobile value, interest centers around the new KisselKar 48 "Six." It is a car that arouses admiration and challenges comparison on every point of mechanical construction, appearance and performance. The more you draw comparisons with other cars, the more fully you will be convinced that the KisselKar 48 "Six" is an automobile of rare distinction and unmatched value.

48 "Six" KISSELKAR 48 "Six"

In the vital features that make a car desirable, the KisselKar 48 "Six" measures up to the highest standards. It is an impressively handsome car with low hanging body and clean, artistic lines that convey an instant suggestion of grace and power combined.

Exceptionally liberal wheelbase, big door openings, special springs and shock absorbers, roomy tonneau, deep upholstered seats and best equipment afford all the comfort and convenience found in any car regardless of price. The KisselKar engine is famous for its power, flexibility and silent, smooth running. It is easily

accessible, transmission and clutch being combined in a single unit.

There are three KisselKar models; 48 "Six" at \$2350; 60 "Six" \$3150 and 40 "Four" \$1850. All are fully equipped, electric lighted and started; left hand drive, center control. Illustrated catalog on request.

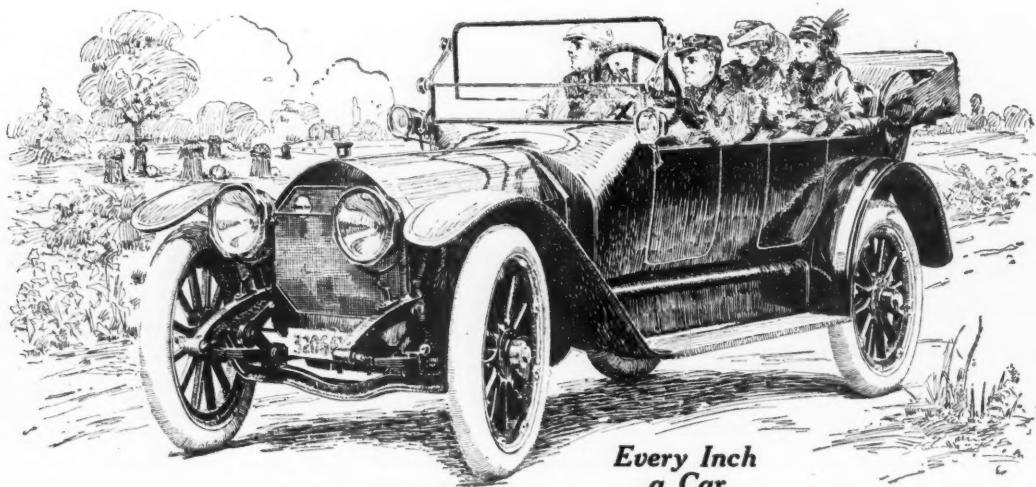
KisselKar Service Contract

KisselKars are sold under a specific guarantee of service to owners—a written contract that stipulates in detail the mechanical care that forestalls trouble and retards depreciation. The unusual facilities at our Service Stations are always at your disposal.

KISSELKAR TRUCKS—Six sizes, 1500 lbs. to 6 tons—
are used in over 200 distinct lines. Ask for truck catalog

Kissel Motor Car Company, 121 Kissel Ave., Hartford, Wisconsin

BOSTON, NEW YORK, CHICAGO, MILWAUKEE, KANSAS CITY, MINNEAPOLIS, ST. PAUL, DALLAS, SAN FRANCISCO, LOS ANGELES, OAKLAND, Philadelphia, Detroit, Houston, El Paso, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Rochester, Providence, Cincinnati, Newark, Montreal, Quebec, Toronto, Winnipeg, Calgary, and 300 other principal points throughout America.



Manufacturers of Electric Lighting and Starting Equipment Who Use and Recommend



Storage Batteries

| | | | |
|--------------------------------|----------------------|-------------------------------|----------------------|
| Adams-Bagnall Electric Co. | Cleveland, O. | Hartford Suspension Co. | Jersey City, N. J. |
| Adams & Westlake Co. | Chicago, Ill. | Holtzer-Cabot Electric Co. | Brookline, Mass. |
| Bailey Electric Co. | Grand Rapids, Mich. | Ide Engine Co. | Springfield, Ill. |
| Bijur Motor Lighting Co. | Hoboken, N. J. | Ignition Starter Co. | Detroit, Mich. |
| Briggs Magneto Co. | Elkhart, Ind. | Jones Electric Starter Co. | Chicago, Ill. |
| Dayton-Dick Co. | Quincy, Ill. | Kemco Elec. Mfg. Co. | Cleveland, O. |
| Dean Electric Co. | Elyria, Ohio | Leece-Neville Co. | Cleveland, O. |
| Detroit Electric Appliance Co. | Detroit, Mich. | National Coil Co. | Lansing, Mich. |
| Diehl Mfg. Co. | Elizabethtown, N. J. | North-East Electric Co. | Rochester, N. Y. |
| Dyneto Electric Co. | Syracuse, N. Y. | Northwestern Mfg. Co. | Milwaukee, Wis. |
| Economy Mfg. Co. | York, Pa. | Remy Electric Co. | Anderson, Ind. |
| Electric Auto-Lite Co. | Toledo, Ohio | Rushmore Dynamo Works. | Plainfield, N. J. |
| Electro Light & Starter Co. | Indianapolis, Ind. | Splitdorf Electric Co. | Newark, N. J. |
| Emerson Electric Co. | St. Louis, Mo. | Wagner Electric Mfg. Co. | St. Louis, Mo. |
| Esterline Co. | Indianapolis, Ind. | Ward Leonard Electric Co. | Bronxville, N. Y. |
| Fisher Electrical Works. | Detroit, Mich. | R. C. Wells Mfg. Co. | Fond du Lac, Wis. |
| Gray & Davis. | Boston, Mass. | Westinghouse Elec. & Mfg. Co. | East Pittsburgh, Pa. |

COUNT THEM

And if you are at all familiar with the various Electric Lighting and Starting Systems you will readily note that there are but three manufacturers whose names do not appear in this list.

A Total of 37 Manufacturers of whom 34 Recommend the Use of **GLBA** Batteries or 91.9 Per Cent

and Agents for cars not equipped with **GLBA** Batteries are insisting that their manufacturers shall adopt them instead of those which are imitations of the **GLBA**.

This overwhelming preference for **GLBA** Storage Batteries is not due to price considerations, as they are not sold on price.

The actual performance, superior quality, long life, enormous manufacturing facilities, and our unequalled service organization are the features that prompt the far-seeing manufacturers to pin their faith to the **GLBA**.

When you buy a car, remember that the starting and lighting system is a vital part of the car equipment.

You want the best. If you insist on a system made by any firm in the above list, you get an **GLBA** Battery with it—if you accept one of the other three, remember that you are not getting a system whose elements are of the best—and only from a combination of the best can be secured that perfect, harmonious operation which insures the utmost efficiency and satisfaction.

Write us for full information

Willard Storage Battery Co. CLEVELAND, OHIO

New York Branch: 136 W. 52d St.
Detroit Branch: 1191 Woodward Ave.

Depots in all principal cities in the United States and Canada.

Chicago Branch: 2241 Michigan Ave.
San Francisco Branch: 243 Monadnock Bldg.
(76)

You cannot possibly realize the amount of severe shock and strain that is concentrated on the bearings of your car and transmitted through the bearings to all the operating parts. This occurs even when you are traveling over city pavements.

Hyatt Roller Bearings cushion and, in a great measure, absorb these shocks, hence relieve the gears and shafts of this strain.

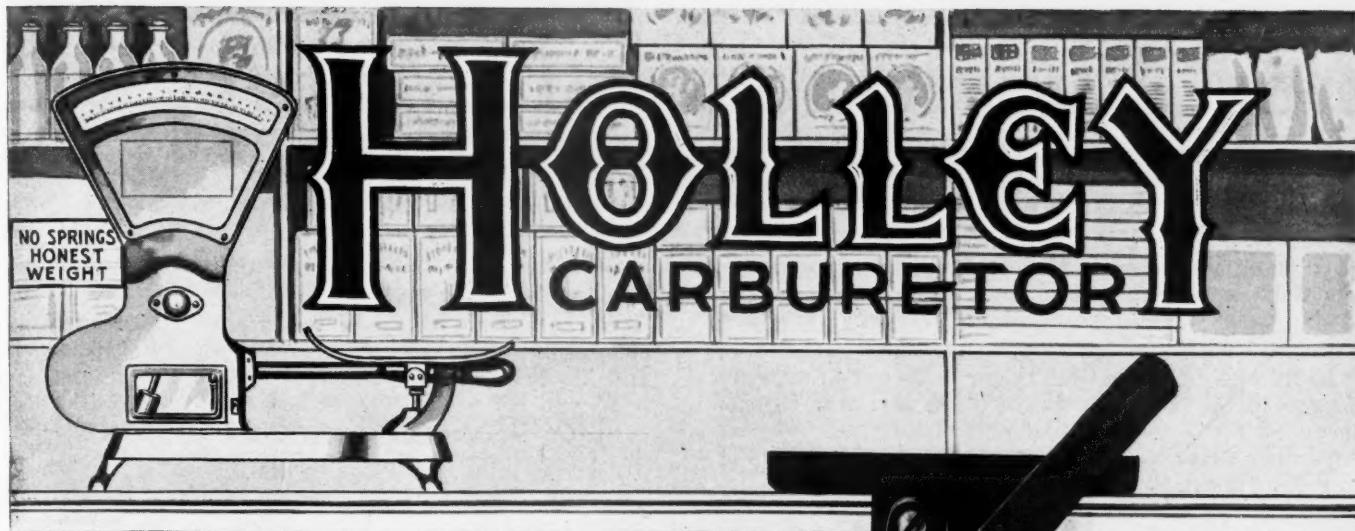
This is due to the Flexible Roller, an exclusive Hyatt feature.

Two books, one about motor car bearings in general for prospective purchasers, the other for automobile owners, will be sent on request

"*Hyatt Quiet Bearings*"



HYATT ROLLER BEARING Co.
DETROIT, CHICAGO
NEWARK, N.J.



Springs have been found to be unreliable for use in all kinds of measuring and weighing devices.

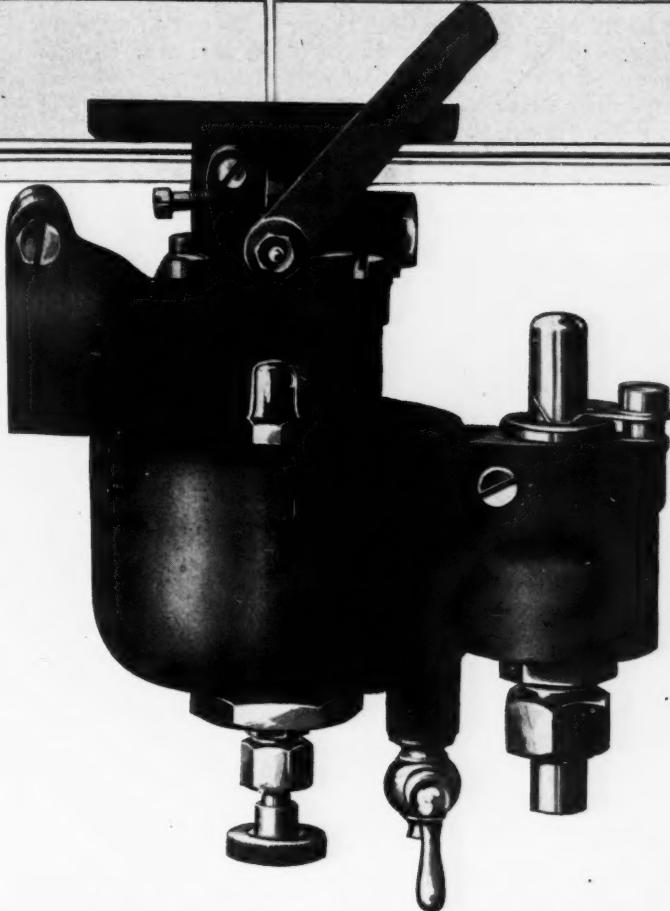
They have been discarded by scale companies as inaccurate and unsuited for precise measurement.

In the new self-adjusting no-moving-parts Holley we have completely eliminated all springs, balls and cams and other unreliable and changeable methods of control, with the result that its action is thoroughly scientific according to well known laws of hydraulics.

The Holley has only one adjustment—a gasoline valve.

You can put it in your car and forget it, and its action is entirely automatic.

225,000 owners attest this fact.



REO ACCESSORIES CO. 1220 Michigan Ave., Chicago, Ill.
OMAHA RUBBER CO. Omaha, Neb.

Foreign Branch: HOLLEY BROS. CO. Coventry, England

Holley Carburetors are carried in stock at the following addresses:

CHAS. E. MILLER, Home Office: 97-103 Reade St. and 121 Chambers St., New York.

BRANCHES:

| | |
|-------------------------------------|---|
| New York City | 924 Eighth Ave., between 54th and 55th Sts. |
| New York City | 2782 Broadway, between 107th and 108th Sts. |
| Springfield, Mass. | Bridge and Dwight Sts. |
| Hartford, Conn. | 274 Trumbull St. |
| Atlanta, Ga. | 66 Edgewood Ave. |
| Brooklyn, N. Y. | 1421 Bedford Ave. |
| Buffalo, N. Y. | 824 Main St. |
| Albany, N. Y. | 135 Central Ave. |
| Boston, Mass. | 202-204 Columbus Ave. |
| Detroit, Mich. | 227-229 Jefferson Ave. |
| Cleveland, O. | 1829 Euclid Ave. |
| Philadelphia, Pa. | 318 No. Broad St. |
| New Orleans, La. | 601-603 Baronne St. |
| Newark, N. J. | 274 Halsey St. |

Holley Brothers Company, Detroit, Mich.

For Purchasers of Motor Cars: Certain Economic Facts of Vi-

It is quite generally known that the Paige Car is a car of extra value for the money.

Many men—thousands of them doubtless—who realize this is so, do not understand *how* it can be so.

Many who admit that the Paige *seems* to be the greatest car in the world at its price are skeptical because they don't see *how* the Paige Company can possibly have such advantages over competing manufacturers as to *permit* the production of so much better cars.

So here we propose to tell just how we *can* and *do* build the greatest automobiles ever produced at their prices, or *anywhere near* their prices.

What Our Small Capitalization Means

If our capitalization was five million or ten million or thirty million we would *naturally* and logically, as business men, have to *try* to earn dividends on such capitalization. Shouldn't we?

That's perfectly simple.

And where would such dividends, or profits, necessarily come from. The *car*, of course. Out of the *price* of the *car*.

The dividends on over-capitalization would be *added* to the natural price of the car, and *you buyers* would have to pay the dividends.

Now what are the facts about Paige capitalization?

Only \$250,000.

Therefore, in order to earn—let us say—ten per cent, or \$25,000, per year on our capitalization, how much do *you buyers* have to *pay us*? On our output of 13,500 cars for the coming season, just \$10.85 per car.

Think that over. Then think this over. If our capitalization—no matter how much "water" there might be in it—was two-and-a-half million, we should have to add \$108.50 per car for dividends.

And if it was five million, the amount would be \$217 per car.

Do you see what *low* capitalization means toward *extra value* in the Paige car?

Stockholders Satisfied With Small Earnings

As a matter of fact, our per car profit is larger than the \$10.85 named above. But the stockholders and directors of the Paige-Detroit Motor Car Company are big business men, men of large interests, building here in this company a great substantial manufacturing concern, and they are *satisfied* with *moderate* earnings on their stock. And every dollar earned above these divi-

dend earnings on this *small* capitalization is *put back* into the car *every season*.

We can prove this. You can prove it *yourself* by comparing the 1914 Paige models with the 1913 models and the 1913 models with those of the year before.

No "Preferred" and No "Water"

Another thing, the Paige capitalization, as you would naturally suppose, is *all genuine capital*. It does *not* include good will, patents or "valuable trade names." Some manufacturers carry items like these as capitalization in amounts ranging from \$5,000,000 to over \$25,000,000. Read those figures over again.

Here's a point, too, that you business men will appreciate. The Paige company's stock is all common stock. No preferred, accumulating deferred dividends if it does not seem advisable to pay them.

Not a Dollar in Bonded Debts

There are *no* millstones of *any* sort to weaken and drag down Paige strength.

No bonded indebtedness, not a single dollar of it. Bonded indebtedness—and it's all too frequently found in almost every line of manufacturing, sometime to the extent of many millions in the case of a single company—bonded indebtedness simply adds another 5 per cent, or it may be 7 per cent, load that the buyer of the product *must* pay.

The purchaser of a Paige car pays for no watered stock and he pays for no bonds. He pays for no other form of obligation or indebtedness, for the Paige company has none, other than current expenses, all of which are paid when due. This brings us to another point.

Lowest "Overhead" and How We Do It

So far as all investigations show, the Paige company operates at a smaller per car "overhead" expense than any other automobile manufacturer.

Is this important to you as a purchaser? It most certainly is. And how have we kept down the "overhead"?

By simplicity and economy in management.

By refraining from that tempting luxury of *branches*. (The Paige company has never maintained a branch.)

By just common, old-fashioned *hard work*. (The same executive staff, identically, that managed the production of 800 cars four years ago is managing the production of 13,500 cars this year.)

DEALERS: There is Some Choice Territory Still Open

PAIGE-DETROIT MOTOR CAR CO.,

s: Here is a Plain Statement of i tal Interest and Importance

By up-to-the-minute methods in the factory. There isn't a piece of *old* machinery in the Paige plant.

Our motor plant, for instance (we build our own motors), is *entirely* equipped with 1913 machines. In some of the best competing plants you would find machinery *eight years old* in use *today*. Eight years is a long time in the business of building motor cars.

The manufacturing conditions are important in fixing the price of a car.

Paige Cars \$300 to \$400 Underpriced

Such favorable manufacturing conditions as ours, coupled with the small capitalization and freedom from bonded or other indebtedness, reduce the price of the Paige car *three or four hundred dollars*.

That is provable, too. You can prove it, if you will compare the Paige with cars that sell for three or four hundred more.

Quantity Output Lowers Costs

You must know, also—we would take this for granted—that so far as lowering costs by *quantity production* is concerned, the Paige Company is in as advantageous a position as any manufacturer. Three or four others are building *more* cars, but not *enough* more to lower costs.

Even a 5000-car output earns lowest prices on parts and materials—if the credit is A1—and Paige production is now more than double that amount.

Furthermore, enormous production does not reduce costs on *machining*, for the tools, dies and patterns (expensive necessities) that will last through a production of 5000 parts are few indeed. Many will not last through the production of 1000 parts.

Financial Strength an Important Factor

We spoke of credit. The financial strength of the Paige company permits it to *command* the work of the highest grade parts and material manufacturers at lowest prices, because the "credit risk" is minimized.

These then are incontrovertible reasons WHY the Paige Company CAN and DOES build—in the Paige car—the greatest automobile value ever produced.

Tear out this advertisement, and save it, to remind you to make comparisons of the conditions back of any automobile you may have in mind.



You Can See the Extra Value

Let it remind you, too, to go see the Paige at your dealer's. See for yourself just how much extra value is in the Paige. You'll find the extra value, all right, and you'll know why and how it comes to be there.

We build two models, completely equipped with electric starting and lighting systems. The famous Paige "36" touring car and roadster, \$1275, also three closed body types, and the Paige "25" touring car and roadster, \$975.

Most Remarkably Priced Car of the Year

The Paige "36" is the most remarkably priced car of the year. 116-inch wheel base, powerful 4x5 quiet Paige motor, unit power plant, cork insert multiple disc clutch. Gray & Davis large unit electric starting and lighting system; ventilating windshield built into body; silk mohair top, tan lined; Jiffy curtains; Stewart revolving dial speedometer; 12-inch electric headlights; electric side lights flush in dash; 5 demountable rims; Goodyear, Goodrich or Diamond tires, with non-skid in rear; Bosch magneto; adjustable foot rail; nickel robe rail; extra tire irons; license brackets; electric horn, pump, jack, tools, tire repair outfit, etc., complete.

Touring car \$1275, 3-passenger roadster \$1275, 4-passenger coupe \$1850, 5-passenger Sedan \$1950, limousine \$2250. Positively the greatest values offered for the 1914 season.

First Car Electrically Equipped At Less Than \$1000

The new Series Paige 25 is the first car with electric starting and lighting equipment ever marketed at less than \$1000.

Compared to other cars, it is underpriced at least \$100.

The semi-streamline design of the body gives it very distinctive beauty.

It is a full five-passenger car. No cramping of space. The seats are wide. The cushions deep. Wheel base 110 inches.

The sturdy Paige motor is as quiet as the watch in your pocket. The regular equipment is complete in every detail. It includes Electric Starting and Lighting System, with generator, storage battery and full lamp equipment.

Rain-vision and ventilating windshield. Silk mohair top and top-boot. Quickly adjustable inside curtains. 5 demountable rims. Goodyear, Goodrich or Diamond tires, with non-skid in rear. Bosch magneto. Speedometer. Linoleum-covered, aluminum-bound floor and running boards. Foot-rail and robe-rail. Dimmers in headlights. Horn, jack, tools, pump, tire repair outfit, etc., complete.

for 1914. Wire or Write for Further Information

304 Twenty-First St., DETROIT, MICH.

STOP Regrinding Valves

Eliminate that constant source of expense and loss of car service. Get the maximum amount of power from your fuel. Do away with leaky valves and consequent poor compression. Save time, trouble, worry and expense by using Rich Tungsten Valves—the valves that can't help seating properly—that never need regrinding and never cause you loss of car service. You can absolutely forget that your engine has valves when using

RICH TUNGSTEN VALVES NEVER NEED TO BE REGROUND



Condition of Valve Made of Cast Iron Used Less Than 200 Miles. Note the Pitting.



Condition of Rich Tungsten Valve After 3411 Miles. Note Glass-Like Surface of Seat.

They positively will not Pitt, Warp or Leak and are absolutely unaffected by heat up to 1700°. They are made in one piece, of a dense, tough, tungsten alloy steel—the toughest and best heat-resisting metal known. The metal in the stem has same heat-resisting qualities as that in the head, absolutely preventing warping, burning, or breaking off of stems.

Save 20% to 30% on Fuel Bills

Rich Tungsten Valves actually make $\frac{3}{4}$ of a gallon of gasoline do the work of a gallon. There is absolutely no loss of fuel due to poor compression. The valves must seat properly—they can't help it. A set of Rich Tungsten Valves will pay for themselves many times over in a season's running, besides eliminating your valve troubles.

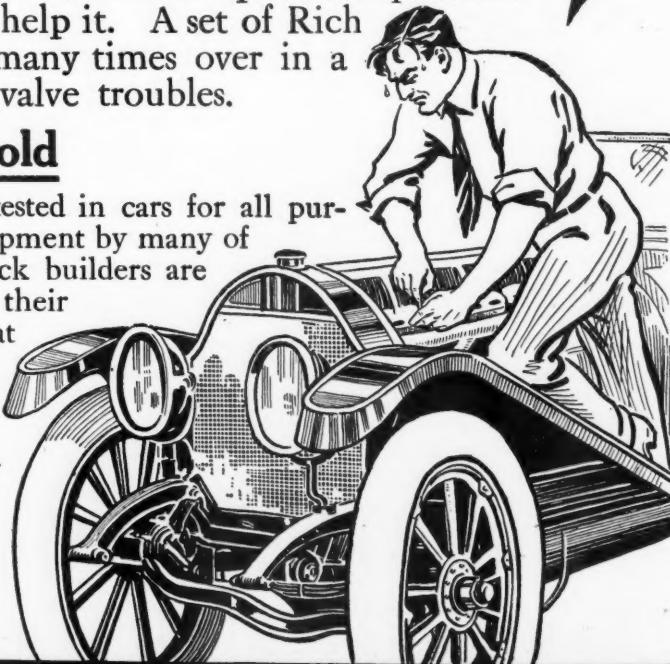
Over 1,500,000 Sold

Rich Tungsten Valves have been thoroughly tested in cars for all purposes and have been adopted as standard valve equipment by many of the leading motor car builders of America. Truck builders are also fast adopting Rich Tungsten Valves, owing to their ability to successfully withstand the excessive heat generated in motors pulling heavy loads.

Send for Interesting Booklet

Tells valve facts of vast importance to users and car builders. Prices on Rich Tungsten Valves of any size and in any quantities gladly furnished on request.

RICH TOOL COMPANY,
414 Railway Exchange Bldg., CHICAGO, ILL.

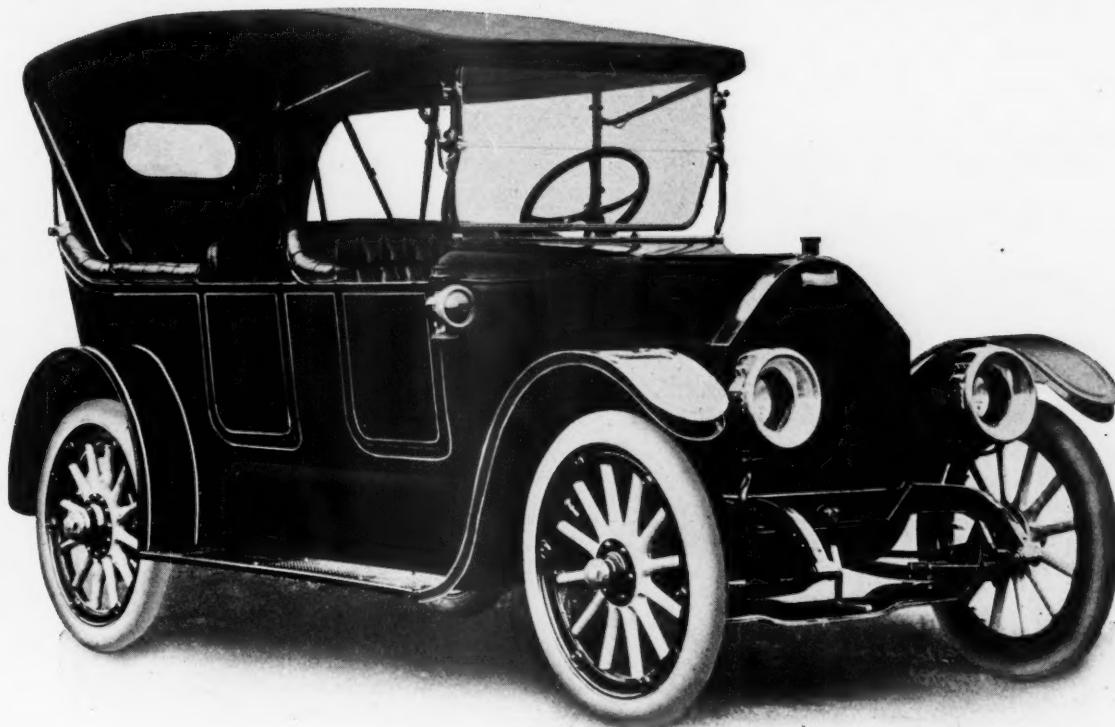


\$975

Completely Equipped

Partin-Palmer "38"

Six Passenger Touring Car



Condensed Specifications

Four cylinder, 38 horse power motor; 115 inch wheel base; 15½ inch leather faced cone clutch; three-quarter floating rear axle; 14 inch brake drums; auxiliary seats to fold back of and under front seat.

We're Making Deliveries Every Day— Our Dealers Are Getting the Business

We're making deliveries of the Partin-Palmer "38" to our dealers every day—our deliveries are increasing each week—and you ought to see some of the enthusiastic letters we're getting from dealers. They're selling every car they get. Are you doing that with the line you are handling?

If you have ever had any doubts as to what you can do in your territory with the Partin-Palmer "38" at \$975, we're going to give you an opportunity to get right. We want you to come into our office and see what other dealers are doing with this wonderful car. We have it right here in black and white. They're getting the business—just as we knew they would—just as we told them and told you.

The Partin-Palmer "38," six-passenger touring car, 115 inch wheel base, selling at \$975, completely equipped, is not an experiment. It's a big, live fact. It's backed by a big, clean organization—men who have made big successes in the automobile business—men who know what kind of car best meets the popular demand.

We want you to investigate two things thoroughly—our organization and the Partin-Palmer "38."

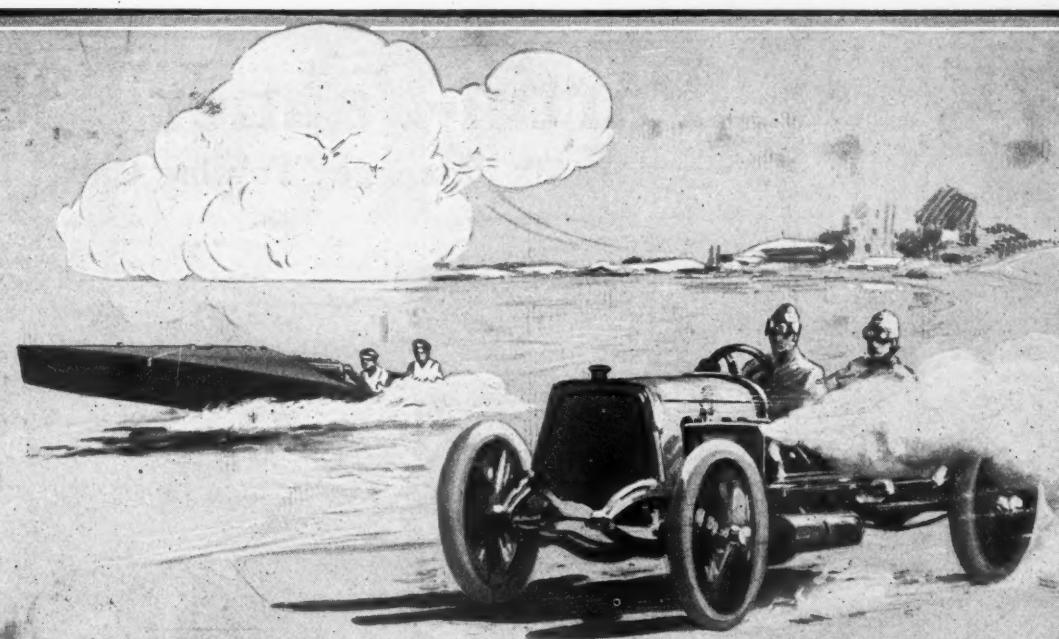
You've long wanted a car such as the Partin-Palmer "38" you could sell for less than \$1000 and here it is—every inch a real car. You know the demand there is right in your territory for this very car.

This superb car is distinctly a product of the most modern and efficient manufacturing methods. It is the only car in the world of the size, length, carrying capacity and power at the price. It gives you the opportunity to sell your prospects the kind of car they want—a newer, bigger, longer, more powerful car, at a price their business judgment will approve—\$975.

Now's your chance to go after your prospects that want a high-grade car at less than \$1000—and the Partin-Palmer "38" is the car with which you can get the business. Now look over your list of prospects—just see how many there are you can close for such a car as the Partin-Palmer at \$975. Stick that list in your pocket and come to Chicago. We'll show you how to add several to it. We want to show you just what you can do with this wonderful car.

We propose to sell the Partin-Palmer "38" strictly on its merits—that's why we want you to see it before you make up your mind. If you can't arrange to come to Chicago at once, wire or write us today for appointment. Tomorrow may be too late.

Partin Manufacturing Co., Suite 547, 29 S. La Salle, St., Chicago, Ill.



Polarine

FRICITION REDUCING MOTOR OIL

For Any Kind of Motor
In Any Kind of Car or Boat

An oil that's right is right in **every** type of motor, whether in a pleasure car, a motor truck or motor boat. The universal oil is Polarine—used everywhere, and sold at cross-roads stations. Users never need go far without it.

Maintains the correct lubricating body at any motor speed or heat, and flows perfectly at zero. Penetrates to the remotest parts of the motor, protecting every friction point.

Cars run for years without depreciation when Polarine is used. **It's the best insurance you can buy**, and costs the least.

The World's Oil Specialists make it after 50 years' experience with every kind of lubricating problem and a study of all makes of motors produced. **Polarine** is the right oil.

STANDARD OIL COMPANY

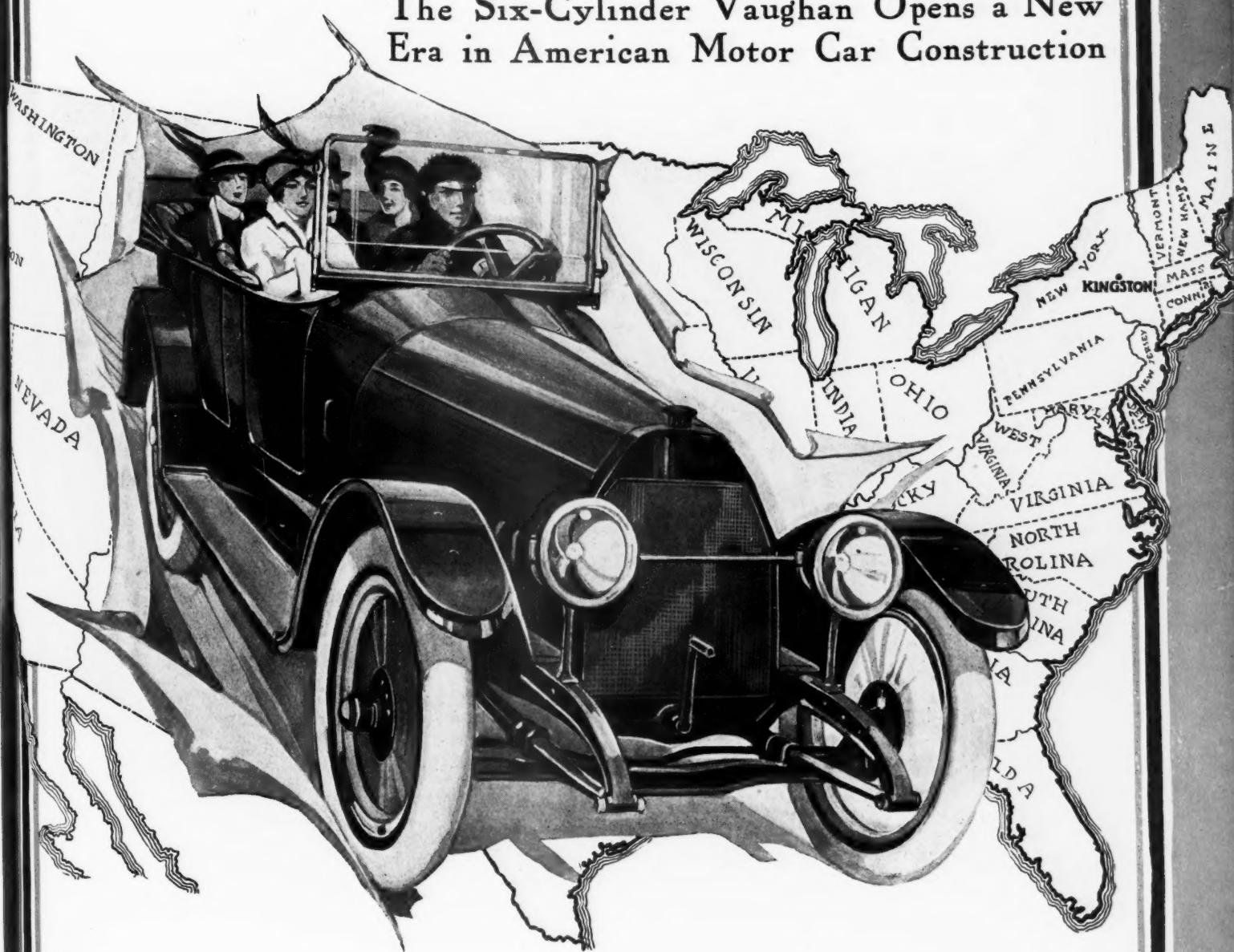
(AN INDIANA CORPORATION)

*Makers of Special Lubricating Oils for Leading
Engineering and Industrial Works of the World*

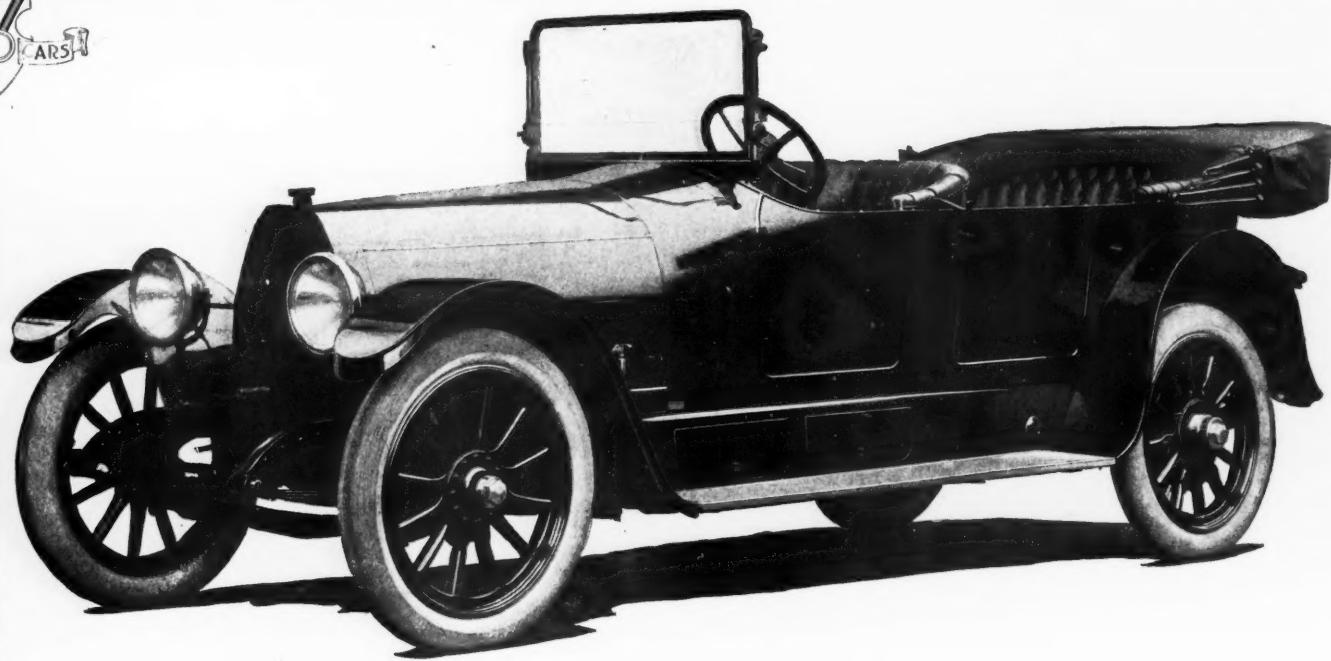
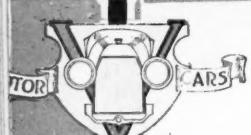
(112)

The Real Automobile Has Arrived

The Six-Cylinder Vaughan Opens a New Era in American Motor Car Construction



It was time that *one* American manufacturer built a car that measured up to the best foreign practice in construction and design. We saw the opportunity — We BUILT THE CAR.



The Six-Cylinder Vaughan is the highest development of the master builder's art.

The car is ready—today:

One week ago we printed a new kind of advertisement of a new kind of automobile in three leading journals of the Automobile Industry. We said we needed 50 progressive men who should be thoroughly representative of the front rank of American automobile distributors.

We were quite sure before the First Advertisement appeared that we would be able to market our 1914 output.

NOW we are POSITIVE of it.

It is of the utmost importance to us that the representation of this new car shall be in the right hands. Our dealers must be men who know how to sell real automobiles and have a following that know *real automobiles*.

Every city now has its group of motor-wise men, who are quickly responsive to every real advance in motor car construction. We want these men to see this car, to ride in it, to drive it *first*.

The man who drives this car on the streets of your city is going to be met with this sort of conversation at his club and in his office:

“Stunning machine I saw you in this morning, old man—that's the handsomest automobile in *this town*. It's a foreign car, isn't it?”



Introducing the *REAL* Automobile

The moment the first car is in your show room, go to the telephone and call Mr. Jones, Mr. Brown, and Mr. Robinson, and say to them:

"Mr. Jones, the new car that I told you about has arrived. It is all that I said it was when I first talked to you about it.

"I want you to sit back of the wheel of this car and tell me what you think about it. I want you to drive it up to your door-step and ask Mrs. Jones what she thinks about it—and we will ask her to ride in it.

"You have been looking for a car that did not look like every other four-wheeler on the block—well, it is here, Mr. Jones. When are you coming up to see it?"

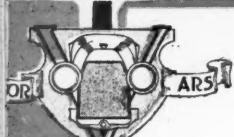
Mechanical efficiency? Yes—we will give you detailed information of the construction of this car in person or by mail.

The six-cylinder VAUGHAN has the stuff in it. As a plain business proposition we had to do this first. Every man who will sell this car knows what is good and what is not good in motor car development.

We had to be right—we are right.

The mechanical development of this motor car was under the supervision of those who knew how to build to win your appreciation and approval. It has "stood up" under the most rigid tests of modern motor engineering.

We are proud of the product. Proud of the six-cylinder VAUGHAN that has a distinction, a style, a character that will stop the man and his wife who instinctively recognize the refined, the beautiful things of this world.



We have a car that is not like any other car made in America.

We want the men who will sell and the men who will drive this car to know that we are expert automobile constructors and have been making and selling automobiles for many years. We know the things that a good dealer must have to satisfy him. We know what we must do to gain his interest, arouse his enthusiasm and win his friendship. We must, through our dealer-friends, make their customers our friends. There must be faith all through—faith in our product—our guarantees—our promises.

The contract we will make with our dealer-friends will be fair in spirit—in proper provision for the future.

We could sell more cars in 1914 than we could turn out, and turn out properly—but we will not.

We could get twice as many dealers as we expect to make contracts with, and disappoint a lot of them—but we will not.

We could make claims, so extravagant, so far reaching that you would say: "Where have I heard that story before?"—but it will not be necessary to go that far.

The car is priced \$2750. Higher price would mean nothing except the payment for something that could not be put into the car.

The car is ready—just now—today. We want to hear from the right men in certain cities. We may have heard from your town, and we may not. You must tell us that "you are interested."

That is all we want YOU TO SAY TODAY.

VAUGHAN CAR CO., INC.
KINGSTON, N. Y.

EVERY MOTORIST IS DOWN TO VOTE
THIS BOOK IS CHART.



As
Sure
as the
Whirl
of the
World

This Book Covers the Following Subjects:
Electric Starting & Lighting Systems.
The Generator.
The Storage Battery.
The Motor.
The Controls.
The Wiring.
The Circuit Breaker.
The Governor.
The Ammeter.
The Switches.

**Write for Your
Copy Today**

and inform yourself regarding the care and operation of the modern Electric Starting, Lighting, and Ignition Systems.

The information given in this handbook and on the operation chart which accompanies it, will give you practical aid in the proper operation of all automobile electric systems.

Explains in detail, functions of the various parts—how to locate and remedy troubles of all kinds—it is the best written book on the subject so far produced.

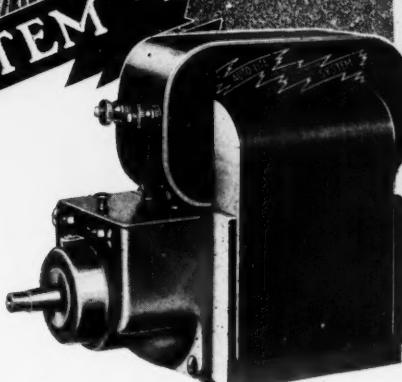
THE ELECTRIC AUTO-LITE CO.

The Pioneer Makers of the 6-Volt
Electric System.

TOLEDO, OHIO

BRANCHES:

New York Detroit Kansas City San Francisco



The large operation chart which it contains is alone worth the price.

Regular price 50 cents.

Will be sent to you for 10 cents in stamps if you use this coupon.

This Coupon Saves You 40c

Electric Auto-Lite Co.,
112 Michigan St., Toledo, Ohio.
Enclosed find 10c in stamps for which
please send me your handbook.

NAME

ADDRESS

Baker Electrics



Announcement

To the Dealer Who Wants The Facts About Electrics

Baker Electrics are the product of the OLDEST, LARGEST, BEST KNOWN and FINANCIALLY SAFEST exclusive manufacturers of Electrics in the world.

Representatives of every other well known Electric have acknowledged that they would rather take a second-hand Baker in trade than any other Electric on the market—you know that this universal admission grants the Baker the best FIRST-HAND value.

Independent garage men all over the country state that the Baker REQUIRES LESS SERVICE ATTENTION and COSTS LESS TO KEEP GOING than any other Electric made.

The SUPERIORITY OF BAKER CONSTRUCTION is a matter of common concession.

No other Electric car manufacturer in business maintains anything to compare with the BAKER TRAVELING ORGANIZATION for constant assistance to dealers.

The sale of Baker Electrics has been developed and KEPT on a liberal profit making basis,—yet Baker prices are no higher than those of any other well known Electric. The Baker Company started its building for the future fifteen years ago.

The dealer makes a greater ultimate profit on a Baker Electric than on any other Electric made.

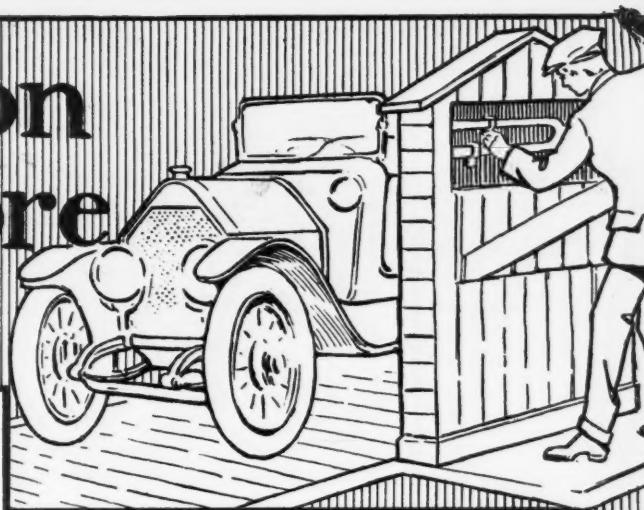
The new Baker Electric Coupe and the new Baker Double Drive, Worm Gear, Brougham embody all the latest developments in electric motor car construction both in mechanical features and body design and equipment. They will be the most easily salable Electrics on the market for the coming year.

Write for descriptive matter and detailed information.

The Baker Motor Vehicle Company, Cleveland

Put the car on the scales before you buy it!

If you want to know how much weight electrical equipment has added to the 1914 car, before you buy it—



Weigh It!

You're the one who will pay the tire bill, the fuel bills, the repair bills—*Weigh it!*

See that all the car's belongings are under the seats, water in the radiator and gasoline in the tank—and then—*Weigh it!*

You don't have to take anyone's word for its weight—*Weigh it!*

If you want to know why the new car is sluggish, feeble on the hills, sudden death to tires and thirsty for gasoline—*Weigh it!*

Then compare the weight with a 1910 or 1911 model of the same car.

Electrical equipment adds a dead weight of 150 to 250 pounds and in addition (by actual tests) consumes 8% to 12% of the engine power.

This calls for larger engine, heavier frames, axles, springs, tires—added weight all the way through.

Either you'll find this or you'll find something worse—for if the manufacturer has not enlarged the engine and other parts to carry excess weight the result is a weak, under-powered, over-loaded car.

If You Want a Real Automobile

full powered, simple, easier on tires, less troublesome, less expensive in every way—see that it is Prest-O-Lited.

Even if the car was designed to carry electrical equipment, the removal of the electric apparatus and the substitution of Prest-O-Lite will make a decided reduction in the weight, stop the power loss, and increase the safety, reliability and economy.

If you want to know why—send for this book.

It shows why electric lighting costs five times more than Prest-O-Lite—how you risk the safety of yourself and family by an unreliable lighting system.

It tells why thousands of motorists are keeping their old cars and refusing to buy the new ones with electric equipment.

The Prest-O-Lite Co., Inc.

233 Speedway,

Indianapolis, Ind.

(Contributor to Lincoln Highway)

Prest-O-Lite can be lit, dimmed and extinguished from the driver's seat. It is the natural solution of your lighting troubles.

EXCHANGE AGENCIES EVERYWHERE



USE THE COUPON

THE PREST-O-LITE CO., Inc.,
233 Speedway, Indianapolis, Ind.

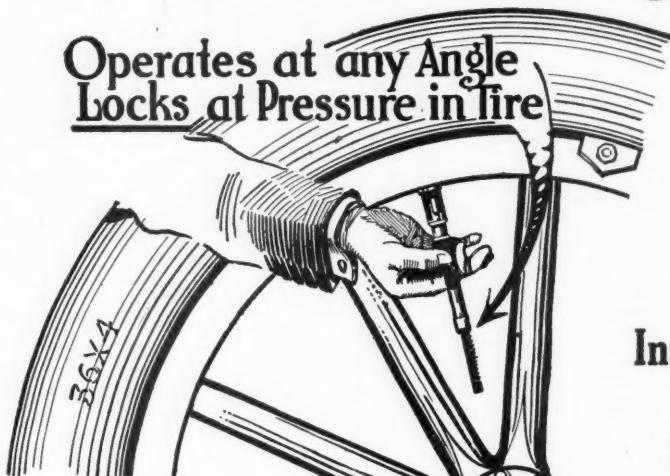
Please send full information on ALL lighting systems to—



The New Positive Lock Stop Twitchell Air Gauge

The demand for Twitchells this year was in excess of our ability to satisfy it. Next year it promises to be even greater. Be ready to meet it.

Operates at any Angle
Locks at Pressure in Tire



Tire
Insurance
for
\$1.00

INSIST upon getting the NEW Twitchell. It possesses a positive lock stop feature that renders absolutely impossible the registration of any but the exact air pressure in your tires. This construction permits the use of the gauge no matter in what position the tire valve rests. You no longer have to turn the wheel around until the valve is at the bottom. Another improvement to be found in the NEW Twitchell is the lengthened base which permits of an airtight connection being made with the valve no matter how small the space between the rim and hub. The gauge may be inclined outward from the valve and almost at right angle with it and no air escape. The NEW Twitchell is accurate, simple, durable, easily applied and easily read.

For the holidays we put up the NEW Twitchell in special Xmas boxes. Make a present of a NEW Twitchell to your motoring friend.

The Twitchell Gauge Company 1201 Michigan Avenue
Chicago, Illinois



Introducing the new
Red Head
 PRIMING PLUG

DAT. OFF.

The Ford Priming Plug That Sparks!

You know what the trouble with priming plugs has been: they would let the gasoline in—fine! but after a few thousand explosions, the plugs “went to pieces.” A leak in the priming device—loss of compression; corrosion of the sparking points—misfiring; cracking of the porcelain—short circuits.

In other words, they took a priming cup and tried to build a spark plug around it.

We took the proved Ford special long body RED HEAD Spark Plug and built a priming cup into it.

Sudden changes in temperature when the motor heats up or cools off will not affect the porcelain—we manufacture our porcelains and guarantee them not to crack on that account.

The sparking points will not burn away—they are meteor wire of non-fusing quality.

The priming cup is of the type used successfully in mechanics for years. No solder or other fusible material is used to make it an integral part of the plug—therefore, there can be no leakage at the joint.

RED HEAD Priming Plugs are useful not only for a quick start but a sure return. Equip your Ford with a full set.

At your dealer's.
 (Notify us if not
 in stock.) Each

\$1.25 Including one set of
 RED HEAD Wrenches free
 with every four plugs.

\$ 1 25

EMIL GROSSMAN M'F'G CO., Inc.

Bush Terminal, Model Factory No. 20

Brooklyn, (New York City,) U. S. A.

Branches: 844 Woodward Ave., Detroit, Mich.; London, Eng.; St. Petersburg, Russia. Stock Depots: Bremen and Hamburg, Germany.

Overland

\$950

Completely Equipped
with electric starter and generator—\$1075
Prices f. o. b. Toledo

THE Overland is universally famous. We print our American catalogues in 1,000,000 lots; we run German, Italian, French, Spanish and Portuguese editions in 300,000 lots.

Such is the demand!

If the 1914 Overland were not MORE CAR FOR LESS MONEY, do you suppose there would be such universal interest in it.

Catalogue on request. Address Dept. 46

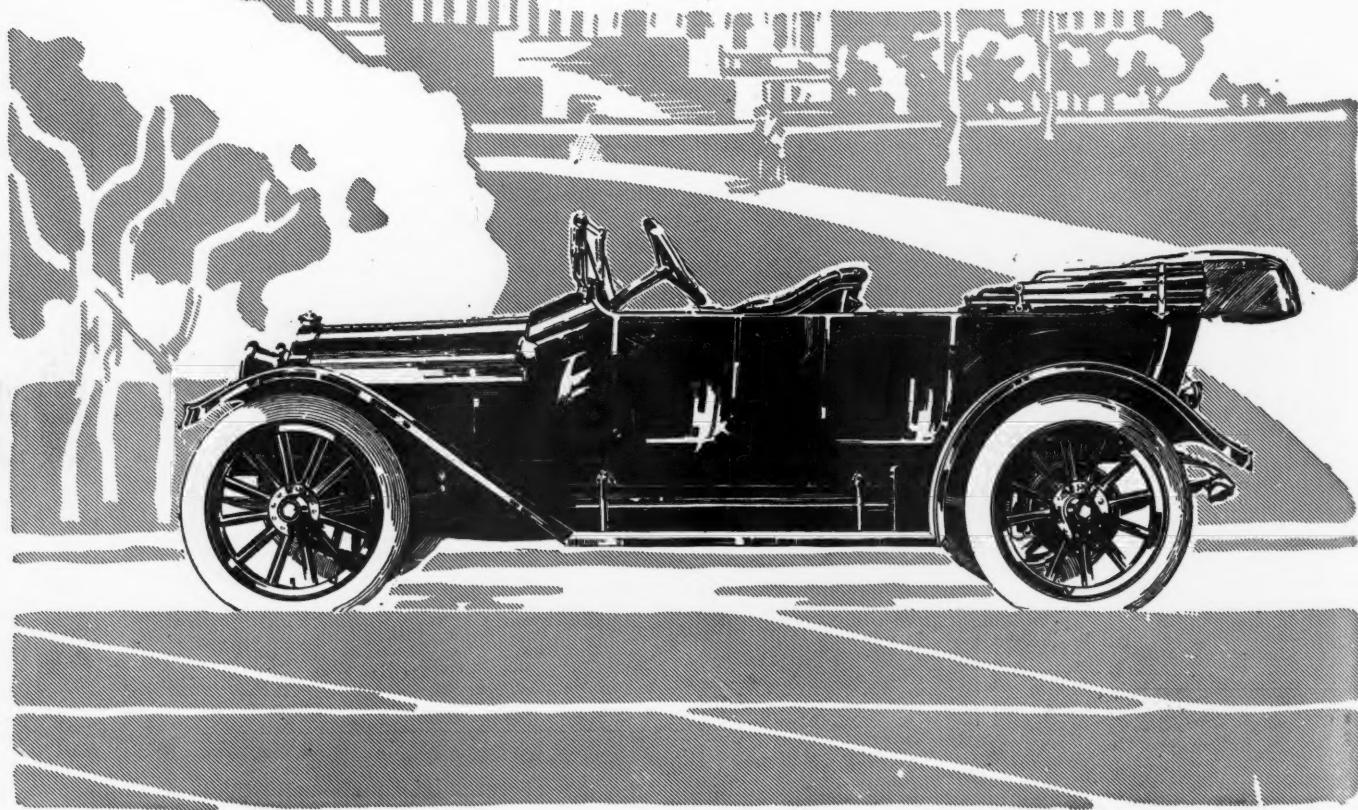
The Willys-Overland Company

Toledo, Ohio

Electric head, side,
tail and dash lights
Storage battery
35 Horsepower motor
114-inch wheelbase
Three-quarter floating
rear axle

Timken bearings
33x4 Q. D. tires
Brewster green body
nickel and aluminum
trimmings
Deeper upholstery
Mohair top, curtains
and boot

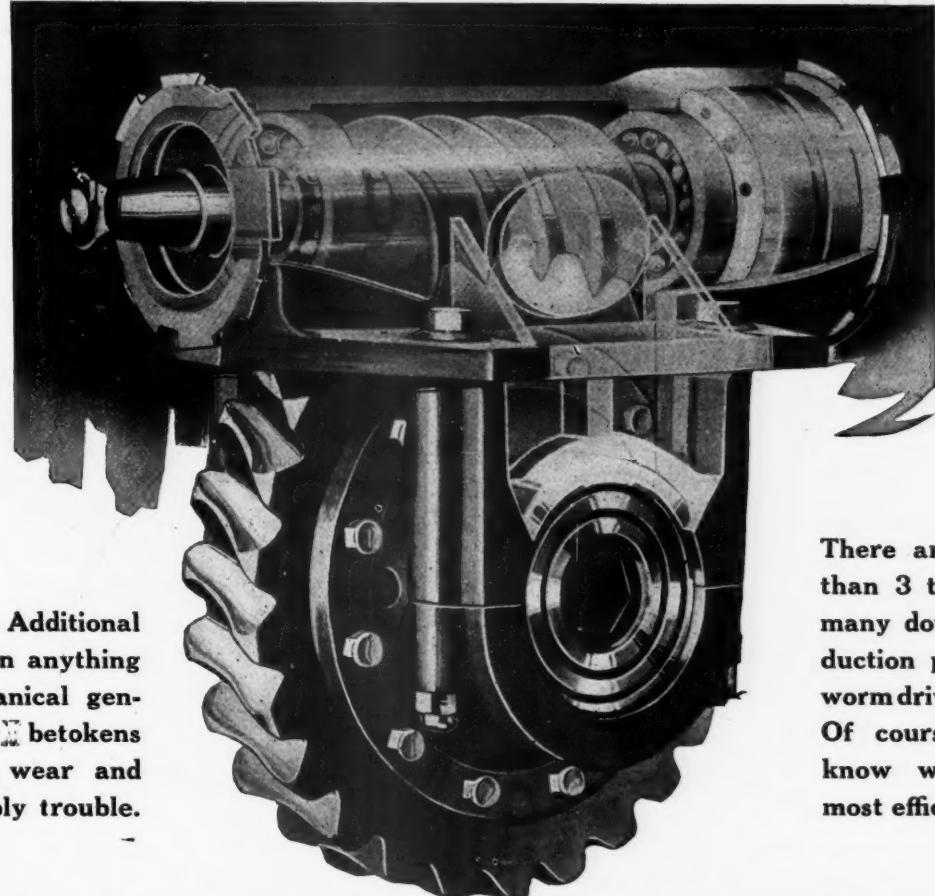
Cowl dash
Clear-vision
windshield
Stewart speedometer
Electric horn
Flush U doors with
concealed hinges



When Writing to Advertisers, Please Mention Motor Age.

YOU BUILD SILENCE, NEATNESS, SIMPLICITY AND EFFICIENCY INTO YOUR VEHICLES WHEN YOU EQUIP THEM WITH THE

SHELDON WORM DRIVE



Every Additional part in anything mechanical generally betokens extra wear and possibly trouble.

There are more than 3 times as many double reduction parts as worm drive parts. Of course YOU know which is most efficient.

A CHAIN is no stronger than its weakest link. Every nut, cotter, washer, head pin casting, forging, chain link and rivet is a necessary unit of the assembly it composes. The failure of one of those units may mean the wreck of your truck, and perhaps the damage of property and the loss of life.

Only one-third the number of parts required for a Worm Drive that are required for a two-step reduction of the chain driven type. This is convincing proof that, all things being equal, the single reduction Worm Drive has a three-to-one chance of giving better service than a two-step reduction with three times as many parts.

But all things are not equal. The Worm Drive is a single reduction, transmitting the power direct from the motor to the rear wheels. It is the only drive in which it is possible to secure this result.

The Worm Drive conserves power because it is a single reduction. Every moving power transmitting unit works in oil, reducing friction to a minimum.

Sheldon Worm Drive is non-adjustable. The Worm carrier is machined exactly true by specially constructed machines.

If the carrier is not true, the Worm can not be assembled. Once assembled the Worm and Worm Wheel can be removed and replaced without disturbing their alignment. No adjustment to tamper with.

It is not necessary to provide adjustment for wear. The slight wear of the imported Worm and Worm Wheel only adds to its efficiency.

Of course, the Worm and Worm Wheel wear out, but not during the life of one truck. The experience of the largest user of Worm Drives has proven this.



SHELDON AXLE COMPANY, WILKES-BARRE, PA.

CHICAGO
68 E. 12th Street

SAN FRANCISCO
444 Market Street

DETROIT
1215 Woodward Avenue



THE BIG



When Writing to Advertisers, Please Mention Motor Age.

Our Liberal One Year Guarantee

Stewart-Warner

We will repair or replace absolutely free of charge at our factory, branches or at any of our authorized service stations any Stewart Speedometer or Warner Auto-Meter or part that proves defective in material or workmanship within one year from date of sale to car buyer, providing transportation charges have been prepaid. This guarantee does not cover fibre pinions.

THE above guarantee is not only the *most liberal* speedometer guarantee ever made, but it is subject to the *most liberal interpretation*.

In effect it covers and guarantees for one full year any Warner Auto-Meter or Stewart Speedometer from the date they go into use; that is to say, from the date any car is delivered to the retail buyer, and *not* from the date the instrument leaves our factory. There is a big difference.

According to terms of our guarantee if there is a defective part to be replaced you do *not* have to return the speedometer to the factory, as is the case with other speedometer manufacturers. Just get in touch with our nearest branch, or service station. We now have fifteen branches and sixty service stations; before long we will have one hundred and fifty service stations.

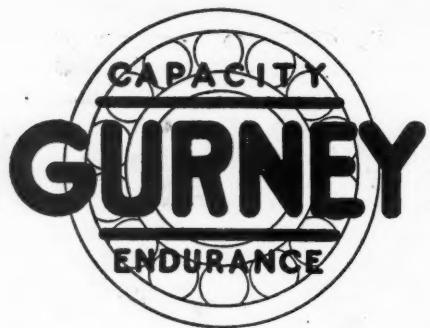
Remember, *in no instance*, do we try to narrowly interpret this guarantee. We take the manufacturer's word, the dealer's word, or the customer's word.

This is the fairest and squarest speedometer guarantee that has ever been written.

This guarantee is backed by one of the largest organizations in the automobile business. It is also backed by the largest chain of speedometer branches, and speedometer service stations in the world.

Stewart-Warner Speedometer Corporation
Chicago, U. S. A.

BRANCHES Atlanta Boston Buffalo Chicago Cleveland Detroit Indianapolis Kansas City
Los Angeles Minneapolis New York Philadelphia Pittsburgh San Francisco St. Louis
Also sixty service stations.



Trials are the Order of the Day

But erring and unfortunate men in high and low estate are not the only objects of judicial investigation. So impersonal a thing as a ball bearing must be subjected to the most relentless trial in testing laboratories and out on the road to discover any hidden fault or weakness. These courts are above any suspicion of partiality. Before these courts the Gurney Ball Bearing has been repeatedly on trial. The verdict is singularly unanimous.



FIAT JUSTITIA

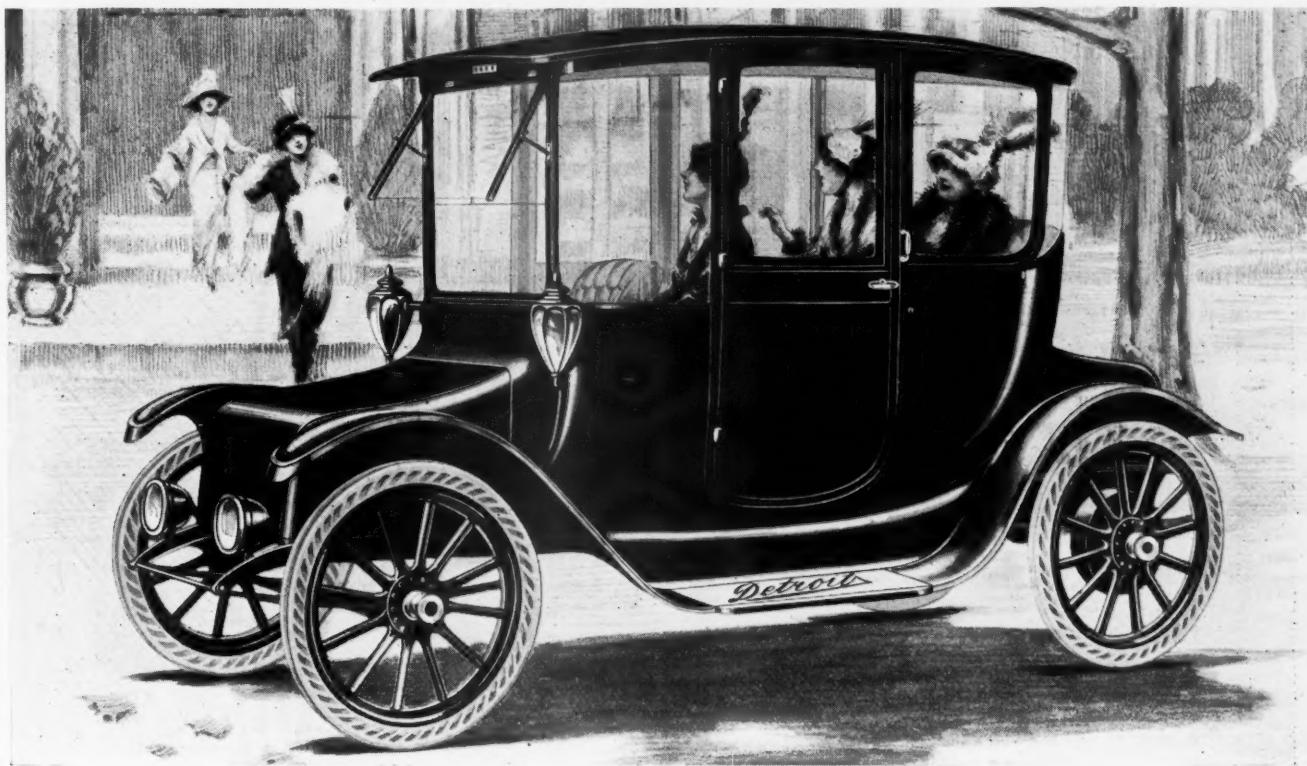
THE VERDICT

Steel—Uniformly good—none better.
Hardening—Uniform—None soft, none brittle.
Balls—The best obtainable.
Accuracy—Unequalled by any other, American or Foreign.
Concentricity—Unequalled by any other.
Load Capacity—Greater than any other.
Thrust Capacity—Much greater than any other.
Endurance—Greater than any other.

THE SENTENCE

Is written on an order blank.

GURNEY BALL BEARING COMPANY
 Jamestown, N. Y.



First Hand Facts About the Detroit Electric

The Anderson Electric Car Company, builders of the Detroit Electric, enjoy the highest financial rating of any manufacturer in the electric pleasure car industry.

The company has ample capital to conduct its business along the most modern and progressive line. Every department of the manufacturing plants is the last word in machinery, equipment and methods.

Increased Volume—Better Cars

The volume of our output is sufficient to warrant the expense of special tools, dies and automatic machinery instead of near-accurate hand black-smithing methods, compulsory to the manufacturer making a few hundred cars yearly.

Strong, yet light weight drop forgings are used wherever possible instead of castings.

We design and manufacture our cars complete, including bodies, rear and front axles, motors, controllers, batteries and other parts. Each part as we make it must work accurately and in full accord with all other parts.

Double Sales Mean Double Profits For the Dealer

Detroit Electric dealers sell at least twice as many cars as other electric car dealers and at list prices. Detroit Electric dealers as a class are the best and most representative automobile men in their respective cities. There are still a few openings for this class of men. We desire to make permanent connections only.

Anderson Electric Car Company, Detroit, U. S. A.

BUILDERS OF "THE DETROIT ELECTRIC"

Largest Manufacturers of Electric Pleasure Vehicles in the World

THE
Detroit
ELECTRIC

Our policy to build in our own shops the finest electric automobile made in the world has established us as the leaders of the electric automobile industry. Our volume has so increased that we are able to make substantial price reductions for 1914, although many improvements and exclusive features have been added.

SAFETY FIRST

"Safety First"
is the slogan of
the great railways

You see it painted on every pillar and post and building along their lines.

And on the boulevard, the street, the country road—wherever you see the trail of the Goodrich Safety Tread you see another "Safety First" slogan.

Goodrich experience, Goodrich knowledge, Goodrich skill and Goodrich methods have put "Safety First" in every thread of fabric and every atom of rubber in

GOODRICH SAFETY TIRE

The anti-skid feature (the safety tread) is great in itself. The thick, tough rubber fingers clean and grip the roadway and hold your car to its course.

We have literally put brakes in the tire for you.

You get constant control of your car—starting, steering, turning, stopping, slowing up or speeding up.

You get lower-cost mileage all the time. The extra thickness of specially compounded, wear-resisting Goodrich rubber in the safety treads means longer wear, longer life and longer service in your tires.

Don't take a chance. Make "Safety First" your slogan—and get it in Goodrich Safety Tread Tires.

Best in the Long Run—Best in the Short Stop

The B. F. Goodrich Co.

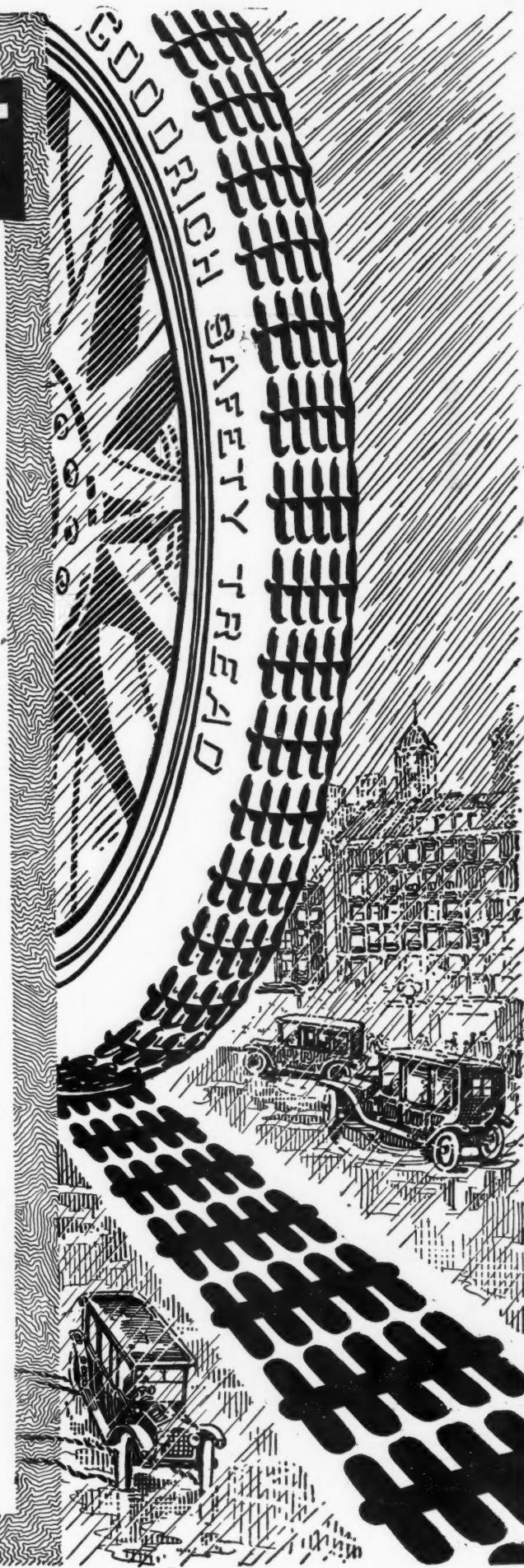
Everything That's Best in Rubber

Factories:
Akron, Ohio

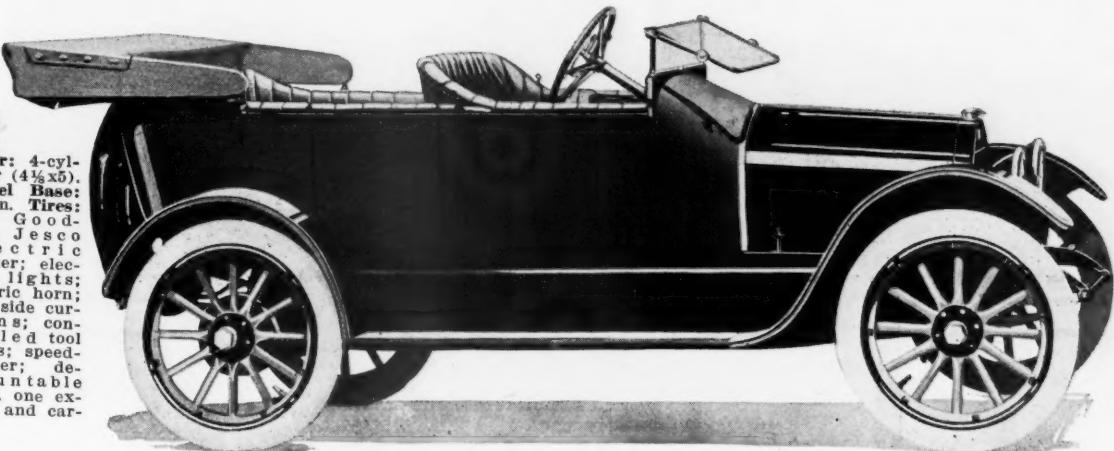


Branches in All
Principal Cities

*There is nothing in Goodrich Advertising that
isn't in Goodrich Goods*



Motor: 4-cylinder (4½x5).
Wheel Base: 114 in. **Tires:** 34x4 Goodyear. **Jesco Electric Starter:** electric lights; electric horn; top, side curtains; concealed tool boxes; speedometer; demountable rims, one extra; and carrier.



Richmond "Four" Model R, 5 Passenger Touring Car. Price \$1250.

DEALERS
\$1250—\$1500
THE RICHMOND **FOUR AND SIX**

Electric Starting

Every part which enters into these cars we make ourselves. We even make the door hinges. Because we pay no profits to parts manufacturers is one of the chief reasons we can market these two cars at such remarkably low prices.

We are admirably equipped to make parts for ourselves because we have been making parts for OTHER car manufacturers for many years.

Electric Lighted

We have 43 years' manufacturing experience. Consequently we back every dealer with a national reputation for service and honesty.

The big demand now is for cars selling at RICHMOND prices. Think of a full-grown Six for \$1500! And its specifications will compare with cars in the \$2000 price class.

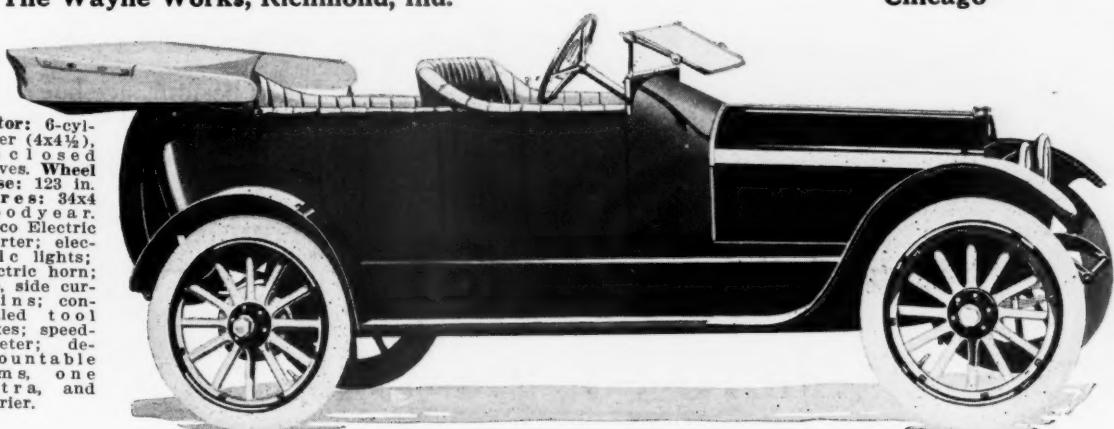
We have some choice territory still open. Write or wire for generous agency proposition.

THE ROSS-STONE COMPANY

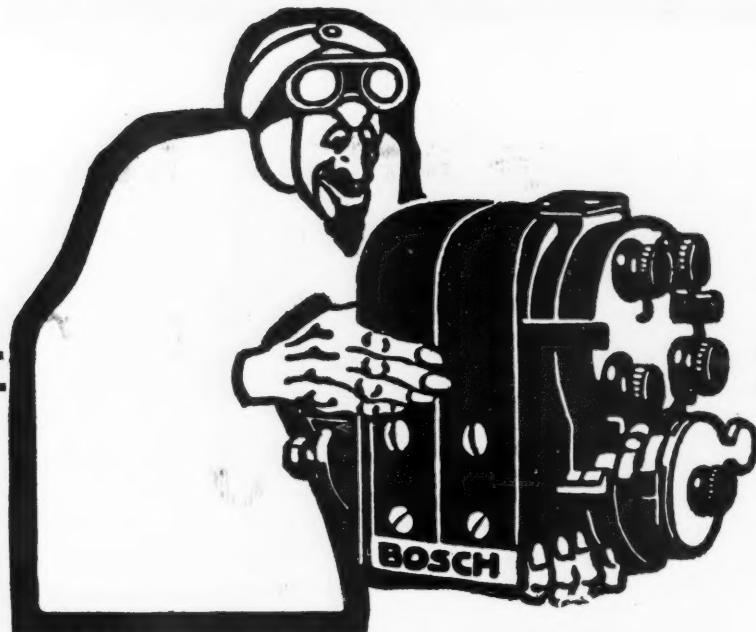
General Sales Agents for
 The Wayne Works, Richmond, Ind.

1712 Michigan Avenue
 Chicago

Motor: 6-cylinder (4x4½), enclosed valves. **Wheel Base:** 123 in. **Tires:** 34x4 Goodyear. **Jesco Electric Starter:** electric lights; electric horn; top, side curtains; concealed tool boxes; speedometer; demountable rims, one extra, and carrier.



Richmond "Six" Model T, 5 Passenger Touring Car. Price \$1500.



BOSCH WINS

Los Angeles-Phoenix Road Race

The Los Angeles-Phoenix Road Race, run under the severest road conditions, was another "Clean Sweep Victory" for Bosch Magnetos and Plugs.

| | | | | | |
|-----|---------|-------|------------|-------|---------------|
| 1st | Davis | - - - | Locomobile | - - - | Bosch Magneto |
| 2nd | Ball | - - - | Marmon | - - - | Bosch Magneto |
| 3rd | Nikrent | - - - | Buick | - - - | Bosch Magneto |
| 4th | Rice | - - - | Simplex | - - - | Bosch Magneto |
| 5th | Buxton | - - - | Mercer | - - - | Bosch Magneto |
| 6th | Richert | - - - | Mitchell | - - - | Bosch Magneto |

A NEW RECORD—84% of the prize winners used BOSCH PLUGS

This showing, made by Bosch, was not an accident, not a mere chance performance but a clean cut, sweeping victory by which it was again proven that Bosch Products give not only reliable and efficient service, but consistent service also. Last year's Los Angeles-Phoenix Road Race was also a Bosch Victory.

**Don't Court Puzzling Ignition Trouble
Be Satisfied :: :: Specify Bosch**

Bosch Plug and Magneto Literature on Request

BOSCH MAGNETO CO., 214 W. 46th St., New York

FULLY EQUIPT STATIONS IN ALL IMPORTANT CENTERS

LOZIER

“Four”

\$2100

It's Ready—Have You Seen It?

The new “Four” you have heard and read so much about is ready sooner than we anticipated. The first completed car was shown to Lozier dealers at the Detroit factory this week.

Production work begins immediately.

Our factories are being rearranged to take care of the greatly increased output.

Only a great reduction in “overhead” makes this car possible at the price, \$2100. Demand has grown almost beyond belief the past four months. 1500 of these “Fours” were contracted for the first week after we announced the car. Now contracts for over 4000 cars for delivery within six months after January 1st are on our books with orders still coming fast. A lot of the best dealers in the country are allied with Lozier for 1914. Territories are closing rapidly. Only a question of a few weeks until the country will be closed solidly.

The car is the wonder of all. Ask any of our dealers what they think of the car they saw at Detroit. Experienced dealers well acquainted with every make of car pronounced it the quietest and smoothest running four cylinder motor they had ever seen.

Everything points to a LOZIER year.

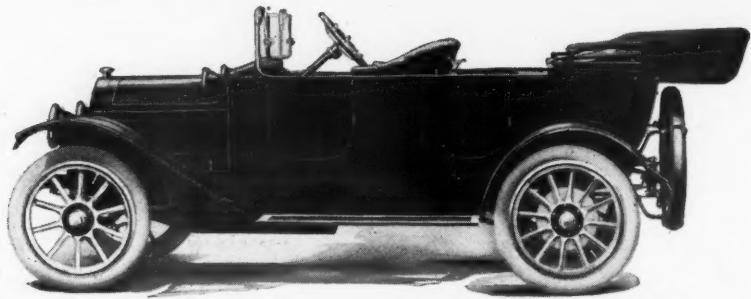
“I can sell Loziers at \$2100 without even a blue print” said one of our dealers. And he did. He took deposits for four cars with no picture to show, much less a car. He wasn’t a big dealer at that.

Think of the great volume of business when demonstrators are in the hands of all Lozier dealers!

We want to assure the dealers and the public that production WILL be able to keep pace with demand. We have increased factory capacity several times over.

Have you seen this great car?

Lozier Motor Company, Detroit



MAXWELL "35-4"

FULLY EQUIPPED—\$1225

This is the same Maxwell "35" that made such a splendid record in 1913, and, with the addition of electric starter and lights (Deaco, dual system), we are now delivering at the sensational price of \$1225 f. o. b. factory.

In a word—a full five-passenger touring car of 111-inch wheelbase; power plus; speed all you'll ever care to drive, and hill-ability all you will ever call upon this car to perform.

Bloc-cast motor, enclosed valves—perfectly balanced and silent.

Body designed by Bruce Ott, the master. Same artistic lines as on the other Maxwell



Models—the fashion-plate 50-6 and the "Handsome does and is" 25-4. Read the specifications and then verify them by rigid inspection and a ride in the car. Compare this \$1225 Maxwell with any other four-cylinder car sold at any price.

Compare part for part—motor, transmission, axles, steering gear and, finally, compare closely—note this point carefully—compare the electric starting and lighting equipment of this Maxwell with that on any other car of similar price—and you'll soon be one of those who say proudly,

"Mine is a Maxwell!"

BRIEF SPECIFICATIONS—MAXWELL "35-4"

MOTOR—Four-cylinder, L-head type, cast en bloc. Bore 4"; stroke 4 3/4".

POWER—35 h. p.

IGNITION—Dual, magneto and dry cell.

CLUTCH—Cone type, leather faced. Takes hold softly, yet holds firmly when engaged.

TRANSMISSION—Sliding gear type, mounted on rear axle. Three speeds forward and one reverse.

CONTROL—Left-hand drive and center control, adjustable brake and clutch pedals. 17" hand wheel.

WHEEL BASE—111".

TIRES—33"x4" front and rear.

TREAD—56"; 60" optional for South.

SPRINGS—Front, semi-elliptic, 36 1/2" long. Rear, three-quarter elliptic, 42" long.

AXLES—Front, drop forged in one piece. I-beam cross section. Rear Axle—Semi-floating type with Hyatt bearings—heavy car design.

BRAKES—Very large, 14" diameter, internal and external acting on same drums.

EQUIPMENT—Electric Starter, top, envelope and Jiffy curtains; clear-vision windshield, speedometer, electric horn; electric side, head and tail lights, tire holder and tools.

PRICE—\$1225 f. o. b. factory, Dayton, Ohio; without electric starter, lights or horn, and with 32"x3 1/2" tires, \$1085 f. o. b. factory.

Maxwell Motor Company, Inc.
DETROIT, MICH., U. S. A.

\$2400

Completely equipped

\$2400

Nothing extra to buy

MOLINE

KNIGHT

More Power

More Flexibility

More Economy

More Silence

It's here—a Moline-Knight—\$2400

For the man who THINKS before he SPENDS

The old poppet valve has outlived its usefulness

The poppet valve served its purpose well in its day—it was the best available motor when it was designed years ago, but it has its limitations as any competent engineer or mechanical expert will admit.

But the things of yesterday will not satisfy you today. The sun dial gave correct time—but you wouldn't trade it for the watch you are carrying.

Once you were contented to ride miles in the old horse-drawn street car—but today even the swift moving electric driven street car seems slow.

The manufacturers of motors have known for a long time that the days of the poppet valve were numbered—they have spent fortunes and years of labor in an effort to get rid of the poppet valve. The Knight motor solves the problem.

Only a small number of motor car builders can obtain a license to build a Knight motor—yet there are thousands of Knight engines in actual use today giving more power, more flexibility, more economy, more silence than the old poppet valve motor.

Europe took the lead in discarding the poppet valve—and the result is such celebrated cars as the Mercedes, the Daimler, the Panhard and the Minerva. A few American builders then began to manufacture Knight motors—until today the Knight motor now holds *undisputed established supremacy*.

Backed by 23 years of successful manufacturing

Charles Y. Knight—the inventor and designer of the Knight sleeve type of motor granted a license to the Moline Automobile Company because along with their nine years successful experience as motor car producers they had fourteen years experience as builders of gasoline engines.

Practically the same officials who constitute The Root & Van Dervoort Engineering Co., makers of the world famed R & V Engines, comprise those who direct the affairs of the Moline Automobile Company. The present output of R & V engines is over 20,000 per year.

Mr. Knight satisfied himself *in advance* that his master blue prints would be religiously adhered to and that the finished Moline-Knight car would be in keeping with his desires and a credit to his organization. He went a step farther—he brought from Europe his most competent engineers and designers and placed them at the disposal of the Moline Automobile Company.

No other organization in the entire motor car industry is better equipped with brains, experience, skilled workmen, modern machinery, plant or financial responsibility to build the *supreme* Knight than the Moline Automobile Company.

Every dealer and motor car owner candidly admits that the Knight design is more *silent* than any other type of motor, but the story of its unusual power, its proven economy, its extreme flexibility, has never been half told.

MOLINE-KNIGHT

A Moline-Knight means

instantaneous getaway—every drop of gasoline consumed—no carbon—no valves to clog or grind—less consumption of fuel per horse power—more power per piston displacement—simpler parts, fewer parts, less to get out of order—economy

Why the motor of the future will not have poppet valves

High compression, large valves, strong springs and precipitous cams are necessary in the poppet valve engine in order to get great power and high speed.

These large valves and their seats will often warp. They do not cool properly because of their large area and the excess heat caused by high compression. The strong springs necessary to seat them at high speeds soon weaken, or actually pound the head of the valve out of shape. That's why racing motors are often built with two exhaust valves to the cylinder—so they can be kept small and cool.

Strongest where the poppet valve is the weakest

In order to be anywhere near efficient, the poppet valve motor must have low compression, small valves, weak springs and a gradual opening cam.

Here is a weakness the poppet valve will never be able to overcome. Small valves and weak springs mean **decreased** efficiency in both power and fuel consumption. The small valves do not admit sufficient gas to generate high pressures behind the piston—the weak springs will not properly seat the valves at high speeds, thus causing them to lag and foul the mixture by permitting the piston to draw back into the cylinder exhaust gases through the exhaust ports when the springs fail to close this port at the proper time. The powerful poppet valve motor requires a cam capable of opening the valves suddenly and wide—and the very nature of this operation prohibits quietness, because the opening must be more or less in the nature of a hammer blow. You can see that quietness and power are impossible with the poppet valve motor.

This is the carburetor side of the new Moline-Knight motor. Note the tire pump in front, also the third control lever which operates the electric starter.

Why the Moline-Knight is supreme

The superiority of the Moline-Knight engine over any poppet valve lies in the fact that the efficiency and durability of the sleeve valve system is not affected by high pressures. The explosion does not affect or shock it at any point because the sleeve valve is balanced against lateral pressure.

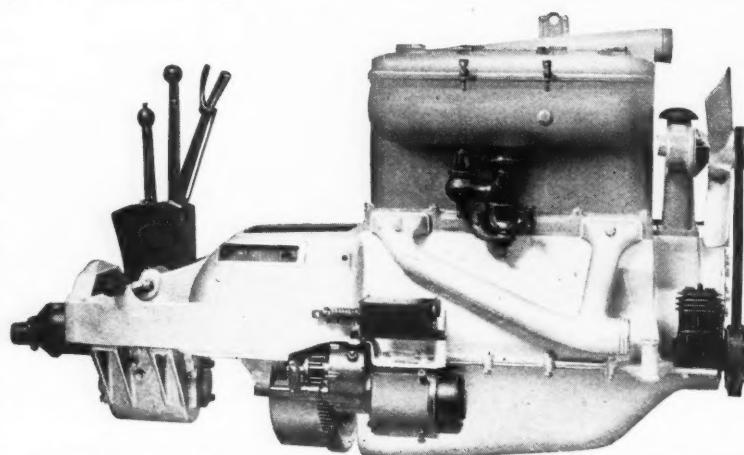
The ports are large, the inlet and outlet most effective for their area and the action of the motor is not affected adversely by their increased size.

In the sleeve valve motor is combined silence, endurance and reliability of the small poppet valves and low compression with the high efficiency of the high compression, large valves, powerful springs and precipitous cams of the racing poppet valve motor, consequently, the operator has in the one sleeve valve **all the advantages** of both types.

A standard sleeve valve motor is capable, as far as efficiency is concerned, of delivering all the power of the racer, with all the softness and quietness of the old style poppet valve motor.

In addition, the operator has within his easy control a surplus of power which he can call into instantaneous service when needed in emergencies. While ordinarily one cannot expect extreme speeds over country roads, yet in the Moline-Knight the power is there when required for acceleration and hill-climbing.

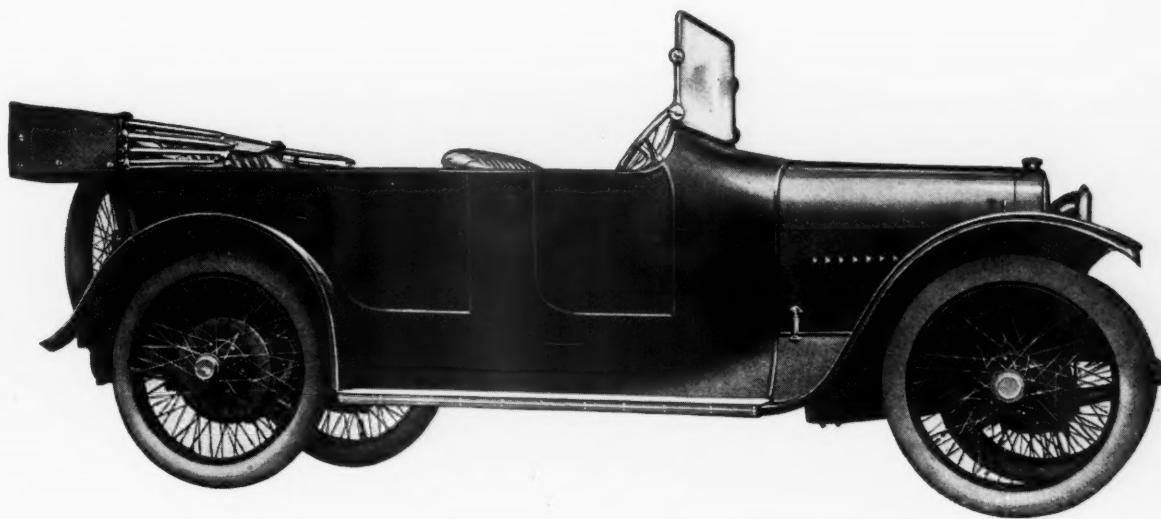
You have been given here a simple statement of the facts—now we are ready to prove to you by actual demonstration that the Moline-Knight has the most powerful, durable, flexible, economical and silent motor ever built—that it will give more satisfaction to the owner than the best poppet valve type of motor ever built.



MOLINE KNIGHT

Moline-Knight

A big, roomy five-passenger car with an electric starter that starts each and every time—perfect streamline body



Four cylinder, five-passenger, guaranteed 50 H. P., 128-inch wheelbase, 36x4½-inch Tires, Bosch ignition, Moline-Wagner electric starting and lighting, \$2400

The “Four” that makes the “Six” unnecessary

Perfect streamline body

yet it has a distinctiveness and individuality. It is the only genuine streamline body built in America—note the absence of abrupt breaks in lines. This streamline is perfect, graceful and smooth, offering the least resistance to air pressure.

We believe that the body is larger than any other five-passenger car built today—it has ample room for the two auxiliary seats for which it is ironed—it will answer all the requirements of the man who wants either a five or a seven-passenger car.

As powerful and flexible as any “Six”

and we stand ready to demonstrate that it is as flexible as any six-cylinder poppet valve engine ever constructed—it has developed far more power and flexibility than any other

In appearance the Moline-Knight is similar to the highest priced foreign cars—

motor of the same piston displacement that we have ever known.

All the durability-contest winning features retained

convenient and dependable car—these cars won durability contests from coast to coast—but in the Moline-Knight we have surpassed all previous efforts. From stem to stern the Moline-Knight is a thoroughbred.

All through the chassis are those parts that by their record have been demonstrated to be the very best—and you will also find them on cars selling from \$1000 to \$2500 more than the Moline-Knight.

Accepted under the Van Dervoort test

Every part selected to go into the Moline-Knight was subjected to the Van Dervoort test, based on President W. H. Van Dervoort's years of experience as a gasoline engine and motor car builder.

MOLINE

KNIGHT

Scrutinize the Moline-Knight before you decide

What you get

In the Moline-Knight, the motor, cone clutch in fly wheel and selective transmission are housed as a unit power plant which is carried on three point suspension.

All operating and mechanical parts are quickly accessible—simply raise the hood, remove the floor boards and you have everything back to the universal joint in plain view.

The frame is hydraulic pressed steel, tubular radiator, drop forged I beam front axle, full floating rear axle, 128 inch wheelbase, selective transmission, half elliptic rear springs of unusual length, Truffault-Hartford shock absorbers, Bosch ignition system, Schebler carburetor, Moline-Wagner electric starting and lighting, spark and throttle on steering wheel with foot accelerator, adjustable foot pedals, Gemmer steering gear, center control, left side drive, two accessible front doors, drive shaft encased in oil, lubrication by force feed through hollow shaft, 36x4½ artillery or wire wheels, Firestone demountable rims, 18 gallon gasoline pressure tank in rear, finished in blue-black, other colors optional with three weeks notice.

Regular equipment

Mohair top, top cover and side curtains, automatic rain vision wind shield, electric starting and lighting system, electric horn, power tire pump, Warner 60-mile speedometer, 36x4½ Goodrich Unit Molded Tires, gasoline and oil gauge on dash, dash light illuminating gauge and speedometer, foot rail, robe rail, tire irons, complete set of tools, jack, tire repair kit, eight-day clock.

Dealers—send this for "Advance Information Folder"

Moline Automobile Co.,

100 Willow St., East Moline, Ill. (Confidential)

I am representing the _____

Automobile here and sell about _____ cars a year. Without obligation on my part, send me by return mail, "Advance Information Folder" on the Moline-Knight—I'm interested.

Name _____

Firm _____

Address _____

Dimmer headlights

The Moline-Knight is equipped with dimmer headlights. By pressing an electric button the big light goes off and the small light comes on. There are no side lights, the use of which would break the perfect streamline of the body.

Price \$2400

Five-passenger with artillery wheels, \$2400; five wire wheels \$75 extra, and two auxiliary seats for seven passengers, \$60 extra.

All prices F. O. B. East Moline, Ill.

Large demand in advance

To the dealer, the Moline-Knight means dollars and prosperity —because he can now sell his trade the car it has long wanted.

To the user, it means a Knight motor for less money—and the four things he has always wanted—more power, more flexibility, more economy, more silence.

The demand for the Moline-Knight is going to exceed the supply. But we will not sacrifice quality for quantity—every car must pass our rigid inspection before it leaves our factory.

Our object is to place our cars in the hands of the right dealers and not to oversell.

We are prepared to make a limited number of contracts with dealers. Just as soon as this season's output is contracted for, we will write no more contracts, because we will deliver our cars on time to every dealer holding one of our contracts.

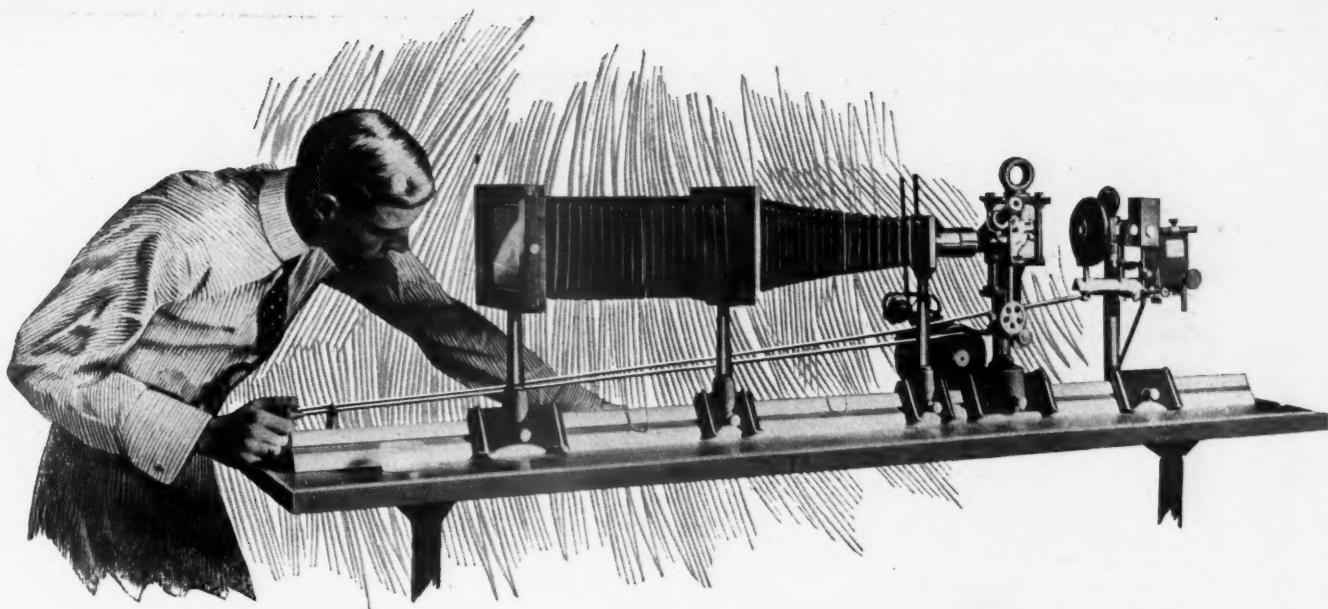
If you are a user and wish to know more about the Moline-Knight—write us at once for our "Advance Information Folder."

If you believe you are the right dealer and entitled from your experience and financial standing to a contract for the Moline-Knight, act at once—wire, use the phone or coupon, or visit us at our factories. Get our "Advance Information Folder" immediately.

Moline Automobile Co.
100 Willow Street, East Moline, Ill.

MOLINE

KNIGHT



Where Bearings Are Read Like Books

STRETCHED across one end of a room in the laboratory is a curtain.

Suddenly the lights go out and on this background appears a picture. To the casual observer it is a puzzle—to the trained eye of the metallurgist it is an open book from which he reads, as easily as you read here, the structure of the steel from which is made the cups, cones and rollers of the

TIMKEN TAPERED ROLLER BEARINGS

Thousands of dollars and years of ceaseless experimenting have been spent in determining the best steel for each part and the proper way in which to carbonize and heat-treat those parts to resist wear.

Experience has proved that if the steel maker lives up to Timken specifications, our carbonizing and heat-treating formulas will bring out the wear-resisting qualities we know bearing parts should have.

So the first big problem is to *know* that the structure of the steel is *right*.

As the X-ray enables the physician to see beneath the flesh and muscles of the human body, so the microscope and the camera lay bare to the eye of the metallurgist the structure of a Timken Bearing.

Nothing must be taken for granted. If the structure of the raw steel is not up to the Tim-

ken specification the microscope and the camera tell the story before a machine can touch it. If the carbonizing and heat-treating do not properly change the structure of the finished parts the microscope flashes the danger signal before the bearings can leave the factory.

It was rightness of principles that first brought fame to the Timken Roller Bearing.

We have never been able to improve those principles. But what we have done, and are doing every month and year, is to make the Timken a better bearing in steel—in heat-treatment—in accuracy.

Added to this is the watchful care of the metallurgists who take nothing for granted—who judge solely by results.

The whole interesting story of the Timken Bearing is told in the Timken Primer No. T-1. Sent free post-paid. Ask for it today.



THE TIMKEN ROLLER BEARING CO.

Canton, Ohio, U. S. A.

Every Timken Bearing, large or small, is of just one Timken Quality, through and through





RODGER'S HEAD

Why drive like a blind man?

Remember how dangerous it was to drive in the rain, sleet and snowstorms of last winter? You had to stop frequently to lower the shield and wipe the glass—or keep the shield down and expose yourself to chilly blasts!

Why put up with such risks and discomforts this winter? With the **SECURITY WIND SHIELD CLEANER** you can keep the glass **absolutely clear** and enjoy a **unobstructed view of the road in any weather**.

The **SECURITY CLEANER** works like a squeegee window cleaner. The rubber blade **squeezes off** the rain or snow on the outside of the glass, as you draw it across with the guiding arm, from the inside. And **dries** the glass as you reverse.

It is the only **WIND SHIELD CLEANER** that **cleans the entire surface of the glass—with one stroke of one hand**. No strings to pull, clamps on the frame—no drilling, no rattling. Four years on the market—thousands in successful use.

AT ALL DEALERS \$150
(Nickel \$2.00)

This Coupon Saves you 25c.

We want you to have a **SECURITY WIND SHIELD CLEANER** on your shield as an advertisement. Your motorist friends will surely buy **SECURITY CLEANERS** as a result. Your dealer will allow you 25 cents for demonstrating purposes when you present this coupon. If he cannot accommodate you, send us the coupon and \$1.25 (\$1.75 if nickel finish is wanted) and we will deliver the **SECURITY CLEANER** to you through our nearest dealer.

EMIL GROSSMAN MFG. CO., Inc.
Bush Terminal, Building No. 20,
Brooklyn (New York City).
Branch, 844 Woodward Ave., Detroit.



HEALD Cylinder Grinder

Are You Passing This Opportunity Day After Day?

Are you failing to take advantage of the most modern method of finishing holes in metals? If your work includes holes not smaller than 2" in dia. x 10" long, nor larger than 12" in dia. x 18" long, our

Cylinder Grinding Machines

will finish them rapidly, smoothly and accurately, save time assembling and increase the efficiency of the finished machine.

Estimates of guaranteed production furnished from samples of work or drawings.

Send for our booklet "CYLINDER GRINDING." It's free for the asking.

THE HEALD MACHINE COMPANY
Chicago Office: 24 So. Jefferson Street

26 New Bond Street **Worcester, Mass.**

More 1914 Cars Will Carry—

GABRIEL SNUBBERS

—Than Any Other Shock-preventing Device.

They are standard factory equipment on the easiest riding cars: White, Peerless, Stearns, Oldsmobile, Lozier. Partial or special equipment on more than twenty others.

So satisfactory has been the service of Gabriel Snubbers, that no manufacturer once adopting them has ever given them up.

Gabriel Snubbers now lead in number of cars equipped, just as they have always led in making cars ride easy, reducing their upkeep expense and increasing their length of service.

Live agents wanted.

Please send for booklet.

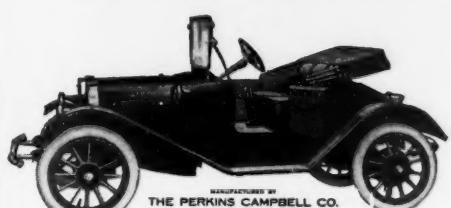


Easiest to apply. Merely clamp coil to frame and secure belting around axle. Nothing to work loose, rattle or wear out. No future readjustment required. Snubbers allow the springs to work naturally on the closing movement, but retard abrupt or excessive expansion; prevent the snappy rebound that jars mechanism and passengers; put a stop to excessive up and down movement of springs.

GABRIEL HORN MFG. CO., 1415 E. 40th St., Cleveland, Ohio

Makers of GABRIEL Musical Horns and Windshield Cleaners

“CAMPBELL” Waterproof SEAT COVERS For Automobiles



Overland Roadster, Equipped with Campbell Covers. Price per set..... \$18.00

DEALERS AND AGENTS WANTED. SEND FOR PRICE LIST.

CONTRACT AND SALES PLAN UPON APPLICATION.

THEY FIT

THEY WEAR

THEY ARE EASY TO PUT ON

THEY WILL PLEASE YOU

BECAUSE

Our covers are made over patterns taken by an expert. THEN we use the best materials in the manufacture of them. No cheap muslin or split leather. THEN they are made right in the largest factory of its kind by people that know their business. THEN they are sold by a firm that has the name of turning out only first class goods and have had that name for over one-third of a century.

We specialize on covers for Overland, Hudson, Buick, Cadillac, Ford, Hupmobile, Studebaker, Maxwell, Reo, Cole and R. C. H., but we have many other patterns.

“CAMPBELL” Little Steam Vulcanizer

Price Complete, \$2.25



The only practical small steam Vulcanizer. Prepare your tire or tube, put on the vulcanizer, light it and leave it alone. It can't hurt your tire and will do it lots of good. Boilers tested to 300 lbs.; you never use over 90 lbs. pressure. Anyone can use this and save lots of money. The man that can't thread a needle can vulcanize his own tubes. Indestructible, safe, saving. Price complete, with cement and gum in a convenient case..... \$2.25

Catalogue of “CAMPBELL” Leather Accessories Upon Request

We will exhibit at New York and Chicago National shows. Call and get one of our beautiful calendars.

The Perkins Campbell Co., 622 Broadway, Cincinnati, Ohio

Dept. D.

"SEE THAT HANDLE?"

A slight pull from the seat starts the FORD CAR—once, twice or a thousand times in succession—in all weathers—all temperature—and under every condition. It removes the very last objection any woman has against a FORD CAR.

A FORD CAR is bought because of its simplicity, reliability and economy. Here's a starter that matches the car in every particular.

THE BOSTON STARTER



It has nothing to get out of order—nothing to cause annoyance and expense. The BOSTON STARTER is purely a mechanical device. It is placed entirely beneath the hood with the exception of the starting handle which is within easy reach of the driver's hand. It is easily installed by any one familiar with automobiles—and once installed the hand-crank can be forgotten.

No FORD car is fully equipped without a BOSTON STARTER. Write for our literature.

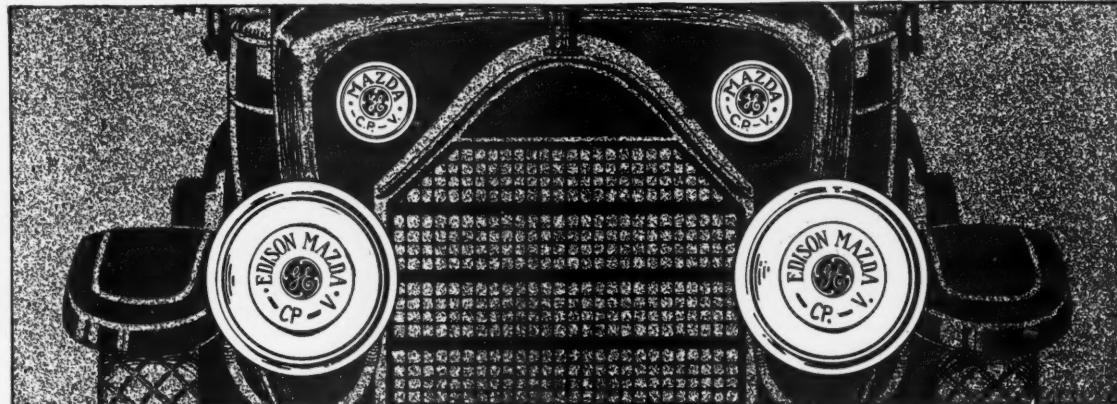
AUTOMATIC APPLIANCE COMPANY

172 Columbus Avenue

Boston, Mass.

Distributed by

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| CHICAGO, ILL., Ford Supply Co., 3021 Michigan Ave. | DETROIT, MICH., Wilson-Schroeter Agency, 1249 Woodward Ave. |
| HARTFORD, CONN., J. Verner Anderson, Conn. Mutual Bldg. | LOUISVILLE, KY., Grady Cary, Paul Jones Bldg. |
| NEWARK, N. J., Ford Specialty Co., 10 Bleeker Street. | PHILADELPHIA, PA., The Pennsylvania Starter Co., 2730 North Broad St. |
| PROVIDENCE, R. I., William Burton, 103 Bradford Street. | RICHMOND, VA., Chemi Company. |
| SCHENECTADY, N. Y., Dorp Auto Company, 307 State Street. | SOUTH BOSTON, VA., Barbour-Wilborn Hardware Co. |
| SYRACUSE, N. Y., F. W. Fischer, 111 East Corning Ave. | AUTOMOBILE SUNDRIES CO., Sole Distributors for Export, 18 Broadway, New York, N. Y. |



All the high grade cars are electrically lighted

The good cars naturally have the highest type of equipment.

Heading the specifications of all the representative cars is—"electrically lighted throughout," and the lamps used are invariably **Edison** Mazdas.

Car manufacturers recognize that to maintain sales and prestige, everything about the car, even down to the smallest details, must be right.

Whatever lighting system is adopted by car builders, the lamps are nearly always **Edison** Mazdas, because of the successful and continued service they give the car owner.

It is this reliability and the efficient and satisfactory operation, under all conditions, that makes the use of **Edison** Mazda Lamps so general.

The thick, strong filaments made from drawn wire tungsten are scientifically constructed so that a large volume of light issues from a small area. This concentrated light source enables the parabolic reflectors to give their maximum reflecting power.

Be sure the lamps you buy bear the name **Edison**.

General Electric Company

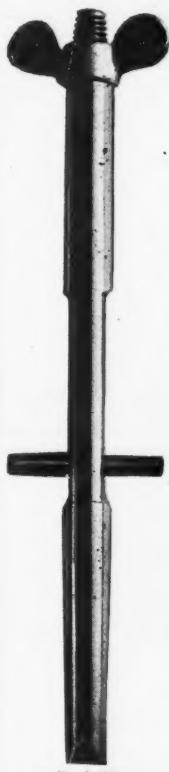
Edison Lamp Dept.

Lamp Agencies Everywhere

Harrison, N. J.

When Writing to Advertisers, Please Mention Motor Age.

THE R-A-B WIRE CLAMPER



R-A-B
CLAMPER
(Patented)

Enables anyone to attach a wire band or clamp to the smallest hose or the largest wash tub. Size of article doesn't count.

A Piece of Ordinary Wire and the R-A-B Clamper Turns the Trick

When the cold weather comes you will need firm connections on all your hose couplings. Radiator fluid is expensive. Don't let it leak out. Get an R-A-B Clamper and with ordinary wire make a clamp that has two pressure surfaces—a clamp upon which vibration or pressure has absolutely no effect.

Add a R-A-B Clamper to your tool kit—use it—and note the time and money it will save you.

It has more uses than any article of its kind yet devised. It is so simple that a woman or a child can use it. All become experts after reading instructions. It can be used to put a clamp on anything. The size of the article to be clamped doesn't count.

Note illustration of clamp. No projections on which to cut flesh or tear clothes. No catch basins for grease or dirt. Here is a clamp that saves the motor as well as the hose.

IT IS GUARANTEED
Price 65c

At all dealers or direct
on receipt of price



Note the clean, firm and graceful clamp

R. A. Beaudette & Company
Chippewa Falls, Wisconsin

DEALERS!

B E A L I V E W I R E

M E E T T H E D E M A N D

This beautiful display card is given free with every half dozen R-A-B Clambers. It is a very profitable silent salesman for your show case. Let your jobber supply you, or write us direct.

The Oil That Oils But
Does Not Carbonize



Don't Take the
Wrong Path, Mr. Motorist

When anyone offers you a "just-as-good" oil at a few pennies less than EAGLEINE NO-KARBON OIL, do not let the immediate saving blind you to the greater expense later on. Poor oil always leads to big repair bills. If you buy poor oil you cannot save, throughout the year, more than three or four dollars; yet when your cylinders become carbon-clogged, piston rings worn out, etc., one repair bill would be many times the total amount you save.

Take the right path at the start. Use EAGLEINE NO-KARBON OIL. It is entirely free from carbon and other injurious ingredients. Its use means a silent, efficient, powerful motor—a motor that is a stranger to the repair shop.

Chicago Branch
1114 W. 37th St.,
Chicago, Illinois.

Eagle Oil & Supply Co.
104 Broad St., BOSTON, MASS.

Roger W. Stadman,
21 Hoover St.,
Los Angeles, Cal.

The Atwater Kent Ford Ignition

does more than eliminate the frequent and troublesome adjustment of the Ford coils.

The Atwater Kent Ignition assures perfect synchronization at all speeds, eliminating preignition and overheating—starts easily with a quarter turn of the crank and frequently without cranking by means of the starting button on the coil.

Effects a saving in gas, wear and vibration by enabling the motor to run

slowly while the car is standing and run as smoothly "on high" at four miles an hour as at twenty or thirty.

The Atwater Kent will, in addition, wonderfully increase the power, speed, flexibility and hill-climbing ability of the Ford car, and gives superior results and costs less than half that of the high tension magneto.

It consists of the Unisparker or distributor elevated to a convenient and accessible position which takes the place of the Ford timer and a single non-vibrating coil is installed in place of the four vibrating coils.

It is easily installed by anyone who can time a motor—no holes to bore—a screw driver and wrench are the only tools required.

Price, complete with hand-operated switch, \$28.00. Foot-operated switch \$2.00 extra.

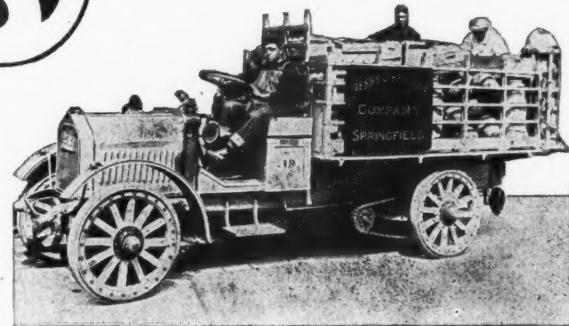
For sale by all good jobbers and dealers. Write at once for circular "A"



Atwater Kent Mfg. Works, 4934 Stenton Ave., Philadelphia, Pa.

\$500 Puts This \$2000 Truck in Service

The Truck itself earns the balance of the purchase price. This means that the makers of the Selden Truck know it is capable of giving constant service—know that it will carry its load day after day and save money while doing so.



The Selden Truck

Is built to give satisfaction. It is bound to be a paying investment to any firm who can use a One-Ton Truck.

THE SELDEN SALES PLAN

After the initial payment of \$500 the balance is paid in twelve monthly installments of \$125 each. Every wholesaler and manufacturer can purchase a truck on this basis without crippling his working capital. It will pay you to investigate.

We Want Dealers Who "Know How" to Sell Trucks

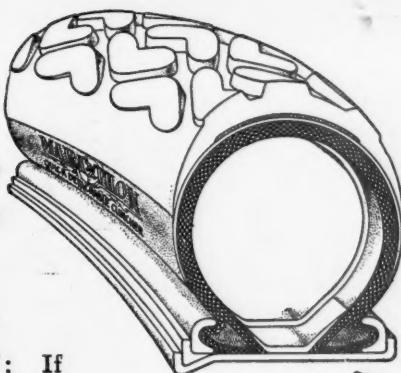
SELDEN TRUCK SALES COMPANY

268 EAST AVENUE

Pioneers in Selling Trucks on Time

ROCHESTER, N. Y.

Factory Insured



GENTLEMEN: If a tire is to give long service and mileage, it must be "BUILT IN" at the factory. There's no question about that. And you know it as well as we do.

The reason why so very few tires give over 4,000 miles service is because only that much service is "BUILT INTO" them by the maker.

THE MARATHON TIRE IS POSITIVELY "FACTORY INSURED." We "BUILD INTO" Marathon the utmost quality—the utmost service. That's why we can guarantee Marathon for 4,000 miles. That's why the major average is far above 4,000.

Read How We Do It!

Finest—Sea Island—Fabric

We use absolutely nothing but Sea Island. That's the best fabric we can buy—the best that's made—highest in tensile strength. It costs us more but it insures greatest possible service to tire users.

Best Rubber That Grows

None but the *Best Rubber* goes into Marathon Tires. That also costs us more, but it's an immense saving to *users* of Marathon tires. We spare no expense in materials.

Very Slow, Very Careful Building

To insure absolutely *perfect* construction, we build every Marathon tire by hand. Expert tire builders do the work—very slowly. Hurrying is not permitted.

This very slow, very careful hand building also costs us more—reduces our profit—but it safeguards Marathon *users* against faulty construction, blow outs and short service.

Wrapped Tread, Open Steam Single Cure

Finally we use a special wrapped tread process and single cure in open steam. That gives unitized construction—makes all parts one. It also intensifies the wear resistance.

Factory Insured 4,000 Miles

That's how we "Factory Insure" Marathon tires—why we can rigidly guarantee them for 4,000 miles. Yet that is the minimum Marathon service. The major average is way above 4,000.

You Can sell this Tire with Entire Satisfaction and make a better profit. Ask for our exclusive dealers' proposition.

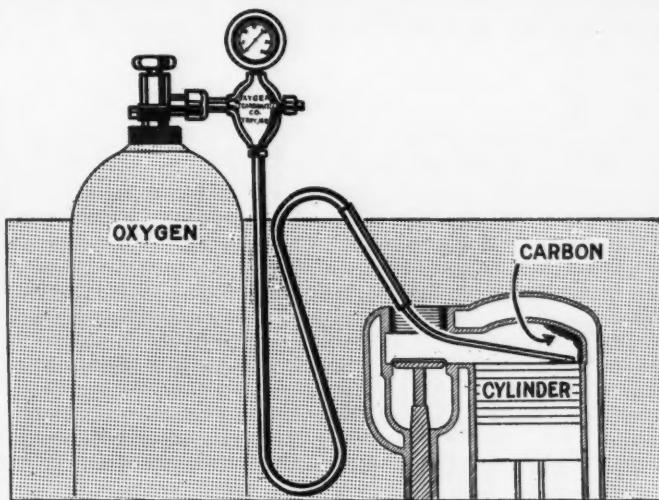
The Marathon Tire & Rubber Co.

CUYAHOGA FALLS, OHIO

Distributors in most large cities



When Writing to Advertisers, Please Mention Motor Age.



A Perfect Carbon Remover for \$10

No need to pay more than this for a first-class carbon remover. Our outfit completely removes every particle of carbon—from **every part** of the cylinders. Does it in less than one quarter of an hour for each cylinder. As a money-maker for garage owners this outfit **has no equal**. It can pay for itself in a few days—after that, all profit. It is also a cheap means for motor truck and large private owners of keeping up the efficiency of their cars.

THE PRICE IS \$10.00. This price is very low but—you get a carbon remover that does the work just as well as any other on the market! Every outfit is

Completely Guaranteed

You take no chances—we stand back of every one we sell.

We make this low price as we sell for cash only and do not carry accounts. Our money is not tied up and we share this benefit with you by taking off $\frac{1}{3}$ of the regular selling price. This is a regular \$15.00 carbon remover but we give you \$5.00 on every one we sell. No other maker can afford to give as good a carbon remover at such a low figure.

Price only \$10.00. Express prepaid
Sent, cash with order—or C. O. D.

Oxygen Decarbonizer Co.
301 River Street, Troy, N. Y.

Send for information!

1855

1914

Jones Wheels

"Best on Earth"

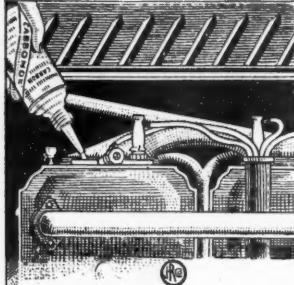
A broad statement, but we stand by it

THE NAME OF JONES
AS APPLIED TO
WHEELS MEANS THE—

**First—Last and
All-the-Time Word
In Wheels**
"Kantsamore"

Buyers of Vehicles should say—
"Give me wheels made by

Phineas Jones & Company
Newark, New Jersey, U. S. A.



Loosens the
carbon in the
cylinder, and
it is blown out
the exhaust.

Carbonox is the simplest, most
satisfactory carbon remover
yet produced.

Chemically Correct

We also make **SE-MENT-OL**
the self acting radiator cement.
"Finds the leak and fixes
it in fifteen minutes."

**THE NORTHWESTERN
CHEMICAL CO.**
Marietta, Ohio.



24 H. P.
Bosch
Magneto
36" Std.
Dem. Tires
2" Axles



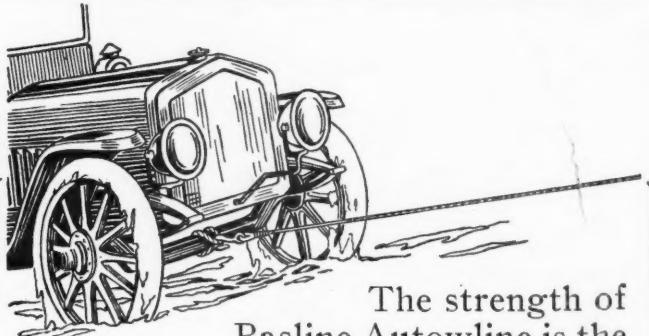
Ten
Stock
Body
Types

SEND FOR CATALOG

You know there is nothing in the market that can possibly compete with it

H. J. KOEHLER S. G. COMPANY
1709 Broadway, New York

DEALERS—If you want to know what other dealers have done
and are doing, ask us for proof.



The strength of
Basline Autowline is the
strength of Yellow Strand Wire Rope
—size for size the most powerful rope
in the world.

This is the famous rope that broke all
previous records in the hardest work on the
Panama Canal.

Twenty-five feet of $\frac{1}{4}$ -inch Yellow Strand rope
is used in Autowline. Weighs only 5 pounds. Slips
under a cushion till needed. Will
get you home every time because it
easily pulls a 4000-pound car up a
20% grade.

Buy one today from your dealer
for \$3.75 and really be fully equipped.

FREE—Autowline circular explains
all. Fully illustrated. Write
for it today. A postal will do.

The Little Steel Rope with the Big Pull

BRODERICK & BASCOM ROPE CO.
813 N. Second Street, St. Louis, Mo.
New York Office, 76 E. Warren St.

Manufacturers of famous Yellow Strand Wire Rope **Trade Mark Registered**



Exact size of alarm

REAR LIGHT-ALARM
THE-GUARANTEED SPECIALTIES CO.
SPECIALTIES
NEWARK, N.J.

The Rear Light Alarm

No motorist who does any amount of night driving can afford to be without an adequate warning if the tail lamp goes out.

The REAR LIGHT ALARM saves fines, prevents collisions, and even saves lives.

The REAR LIGHT ALARM is your guard in the rear. Should a filament, or bulb, break—if the connection is faulty or wires broken, causing the tail lamp to go out—this alarm will start a continuous buzzing that demands attention. You can't drive with a dark lamp if this efficient alarm is attached.

The REAR LIGHT ALARM is easily attached; requires no attention and costs nothing to operate. Satisfaction guaranteed or your money back.

For oil lamps..... \$ 3.50
For electric lamps..... 5.00
Changing oil to electric, complete..... 10.00

Ask your dealer or send prepaid upon receipt of price.

The Guaranteed Specialties Company
KINNEY BUILDING
NEWARK, N. J.

PRESTO CIGAR LIGHTERS INSPECTION LAMPS

No motorist who can afford a car can afford to be without one of these little time and trouble saving devices. "Presto" Cigar Lighters can be used to light a cigar, regardless of at what speed your car may be going. No more stopping to light up. These Cigar Lighters are also the safest and surest devices on the market for lighting acetylene gas lamps. No more scratching matches in the wind and rain.

"PRESTO" Inspection Lamps are invaluable when it comes to night breakdown on the road. No necessity for lighting dangerous matches, or removing one of the car's lamps. "Presto" Inspection Lamps are lighted by simply pressing a button. Quick, safe, certain!

These devices are handsomely finished, nickel-plated, with polished ivory push buttons.

At all dealers or sent prepaid on receipt of price. When ordering direct, state battery voltage.

PRICES

204. "Presto Ford" Watch-type Cigar Lighter. Complete with 10 ft. silk cord and holder. \$2.50 each.
205. "Presto Star" Watch-type Cigar Lighter. Adapted to all other makes of cars. Complete with holder. \$2.50 each.
200. "Presto" Combination Lighter and Lamp. With 10 ft. silk cord, \$3.50 each. With holder, \$3.75.
201. "Presto" Inspection Lamp, \$2.00 each. With holder, \$2.25.
202. "Presto" Cigar Lighter. \$2.50 each. With holder, \$2.75.
Fully protected by U. S. Patents.
DEALERS: Prepare for the holiday trade by taking out the complete "Presto" line. "Presto" devices are the fastest selling novelties of their kind. Write.

Sole Manufacturers
METAL SPECIALTIES MFG. CO.
730-738 W. Monroe St. Chicago, Ill.

"The Acme of Precision—Is the Warner Transmission"

Transmissions!!

"Our various designs of transmissions involve both light and heavy gear sets of both unit and sub-frame type, their capacity ranging from the lightest of pleasure cars to the heaviest of commercial vehicles."

"Warner Gears—Standard for Years"

WARNER GEAR CO.
MUNCIE INDIANA.
DETROIT OFFICE - 628 FORD BLDG.

Starts—Lights—Ignites

REMY

Six Volt System—Does-It-All

THERE is only one real way to provide for the efficient starting, lighting and ignition of your car.

Have one manufacturer design and build all three systems; have this one manufacturer responsible for all three.

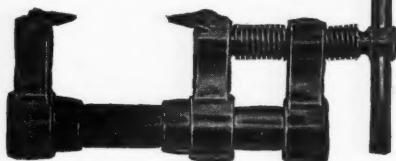
We are the only concern building the complete apparatus—either as a whole or in any combination—starter—lighting equipment—magneto, or battery ignition (generator and storage battery). The starting and lighting equipment is sold only to automobile manufacturers.

Write for our magneto exchange offer.

Remy Electric Company
General Offices and Works, Anderson, Indiana

BRANCHES:
New York Detroit Kansas City Minneapolis
Boston Chicago San Francisco
(Service stations throughout the country)

Make Your Car Ride Easier



GET 50 to 100 per cent more resiliency and longer life out of your springs by properly lubricating them. You can do it quickly and easily with the—

Knowlson's Spring Leaf Spreader

made of the highest grade drop forging, nickel plated, polished and well finished—adjustable to any size auto spring—separates the leaves just enough to insert the lubricant—does away with the jacking up of the car—used as a clamp for broken springs.

\$1 .50 all dealers or sent prepaid

Spring Leaf Lubricator Co.
1004 Forest Ave. ANN ARBOR, MICH



"A Detail of Perfection"

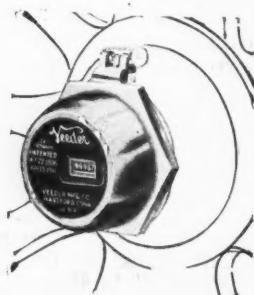
is positively necessary in any instrument used to keep tabs on cost of upkeep. Tires, gasoline or "juice," and lubrication cost can only be correctly ascertained with the VEEDER HUB ODOMETER—a perfected instrument that can't be fooled with.

Neat, durable and compact, it can be easily attached. **\$25.00**
Price complete.

At your dealer's, direct from our factory, or at the following agencies:

T. H. Cranston & Co., 56 E. Randolph Street, Chicago, Ill.

Bernard L. Bill, 543 Golden Gate Avenue, San Francisco, Cal.



The Veeder Manufacturing Company
O. H. VEEDER, President D. J. POST, Treasurer
H. W. LESTER, Secretary
HARTFORD, CONN.

Makers of Cyclometers, Odometers, Tachometers, Tachometers, Counters and Small Die Castings

Splitdorf "Ford Special" Waterproof High Tension Magneto

is a magneto *you* can apply to *your* Ford car, and it will give the motor the response and flexibility of the highest priced automobiles.

A SPLITDORF "Ford Special" magneto increases motor efficiency 33 1/3 per cent, saves its cost in less gasoline consumption, assures constant electric lighting and is installed easily, quickly and inexpensively.

Write to Nearest
Branch House for Details

SPLITDORF ELECTRICAL CO.

Atlanta, 10-12 E. Harris St.
Boston, 180-182 Mass. Ave.
Chicago, 64-72 E. 14th St.
Detroit, 972 Woodward Ave.
Kansas City, 1828 Grand Ave.
Los Angeles, 1226 S. Olive St.

Newark, 290 Halsey St.
New York, 18-20 W. 63rd St.
Philadelphia, 210-12 N. 18th St.
San Francisco, 1028 Geary St.
Seattle, 1628 Broadway.
London, Buenos Aires.

Factory, Newark, N. J.

Hotel La Salle
CHICAGO'S FINEST HOTEL
ERNEST J. STEVENS, Vice-Pres. and Mgr.
Located in the heart of the city, within easy reach of all railway terminals

RATES

| | | |
|--------------------------------|------------------------------|--------------------|
| ONE PERSON | Room with detached bath..... | \$2 to \$3 per day |
| | Room with private bath..... | \$3 to \$5 per day |
| TWO PERSONS | Room with detached bath..... | \$3 to \$5 per day |
| | Room with private bath..... | \$5 to \$8 per day |
| TWO CONNECTING ROOMS WITH BATH | | |
| Two persons | \$5 to \$8 per day | |
| Four persons | \$8 to \$15 per day | |
| SUITES | \$10 to \$35 per day | |

LA SALLE AT MADISON STREET, CHICAGO

¶ Ever try to sell a second hand car that wasn't made any more?

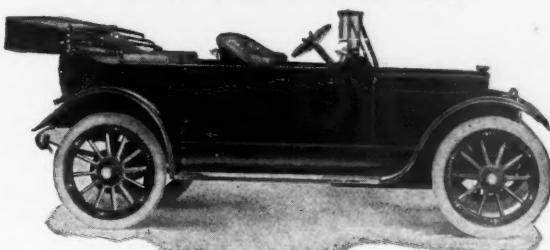
¶ It is some job.

¶ We won't attempt to give here the varied collection of objections the prospective buyer offers but—

¶ They can and will be raised against any car whose maker is now in financial difficulty or regarding which there is the slightest whisper of impending trouble.

¶ The Apperson Brothers have been making the

Famous Apperson "Jack Rabbit" "THE WIZARD OF THE HILLS"



FOUR-FORTY-FIVE TOURING—\$1785.00

at Kokomo, Indiana, continuously since 1893.

¶ Think it over.

¶ Now and then a good territory open for a business-man dealer.

Address Department "B" for prompt attention

Apperson Brothers Automobile Co.
Kokomo, Indiana

Chicago Branch: 3300 Indiana Avenue

THE IMPROVED Michener Gasoline Saver and Primer



is the last word in the auxiliary air valve. It gives you what you want when you want it.

You want to cut down your gasoline bills. I GUARANTEE this device to save you from 25% to 40% of gasoline, at the same time increasing the efficiency of your engine to a corresponding degree.

You want complete control of the fuel mixture at all times. This device gives it, from the driver's seat:—a rich mixture for easy starting and heavy load, and a lean mixture for speed and economy of fuel.

You want, above all else at this time of the year, a primer that will instantly prime your motor. I GUARANTEE this device to start the motor in the coldest weather.

Nothing could be handsomer than our new 1914 model, which we are just ready to put out. It is an addition to any automobile.

LET US SEND YOU FURTHER INFORMATION

\$5.00 Dash Control

\$6.00 Steering Post Control

Post Paid. Brass or Nickel Finish.

When ordering, state which side of motor carburetor and steering post are on.

Please Note:—PRICES after Jan. 1st, \$5.50 Dash Control, \$6.50 Steering Post Control.

After 30 days' trial if you are not absolutely satisfied, we will return your money without an objection—you to be the judge.

AGENTS WANTED IN UNOCCUPIED TERRITORY

E. S. MICHENER, Washington St., New Castle, Pa.

Simple, Efficient and Economical

The
K-W
Electric Headlight Outfit, \$40

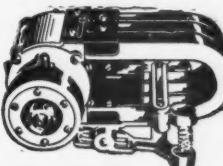
Complete outfit: Generator, Head Lamps, Switch, Wire and Bulb

Easy to Install. Mount in Any Position

Runs in Either Direction

Has Only
One Moving
Part

No
Commutator
or Brushes



Gives 2.1600 C. P. Headlights

Send for Descriptive Folder P. We Also Make a

K-W Ford Electric Headlight Outfit, \$15

FOR FORD CARS WITH FLYWHEEL MAGNETO
and the famous K-W Master Vibrator
The Standard by Which All Others Are Judged

THE K-W IGNITION CO.
TRADE MARK
2835 Chester Avenue
CLEVELAND, OHIO, U.S.A.

The Oxy-Carbon Removing Outfit

Big Profits to Garages

Use the scientific method of removing carbon from engine cylinders. Most thorough, cheapest, quickest, safest, cleanest and most satisfying to your customer. You cannot afford to be without it.

Done in three minutes per cylinder. Costs fifteen cents per cylinder. Carbon converted into carbonic gas. No flakes to get under valves.

Something entirely new—200 in use in Boston already. Take out the valve cap, drop in a lighted match and pull the trigger.

One look will convince.



It eliminates the knock and makes the car run like a watch.

—One Tank of Oxygen will clean out 30 to 40 cylinders and this gas can be procured of any local Oxy-Acetylene Welding Shop or of the Manufacturers having Charging Stations at convenient points in various sections of the country.

Price to Garages, \$25.00

Dyer Apparatus Co., Boston, Mass. —³⁹ Piedmont Street

What can we do to convince you that the
GALLAGHER CARBURETOR
is the only practical one on the market?

"It's Different"



Gallagher Carburetor Company
1876 BROADWAY, NEW YORK CITY



The Rhoades' Unit Spark System

for Ford cars supplies a true high tension magneto spark in perfect synchronism. As an intense spark is produced at very low speed (even when the motor is at rest) it is incomparably superior to the best magneto manufactured. Just compare the price, \$27.00 complete. Allowance for your old coil.

Complete Ford line embracing the famous Model "T" Master Vibrator, price \$10.00, "NYCO" Accelerator and Power Adder \$5.00, the "NYCO" two System Switch allows either the master vibrator or coils to be used, and our large master vibrator with kick, snap, and lock switch.

NEW YORK COIL COMPANY
338 Pearl Street
WESTERN BRANCH, 1429 Michigan Ave., Chicago, Ill.

When Writing to Advertisers, Please Mention Motor Age.

Gyroscope Principle

The New Jones Speedometer Unaffected by Heat or Cold

You want absolute accuracy in speed readings just as you want the right time from your watch. There is one way to get it—get a New Jones.

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, tests and experiments that show Jones supremacy beyond question. Then specify what speedometer you want on your car this spring.

The Jones Speedometer

Broadway at 76th Street
NEW YORK

Guide

DEALERS' PROPOSITION

Our dealers make money. We help them move the goods and Guide lamps make satisfied customers. Write for our proposition.

THE GUIDE MOTOR LAMP MFG. CO.
East 4th Street (36) Cleveland, Ohio

WINTON SIX

What's Most Important

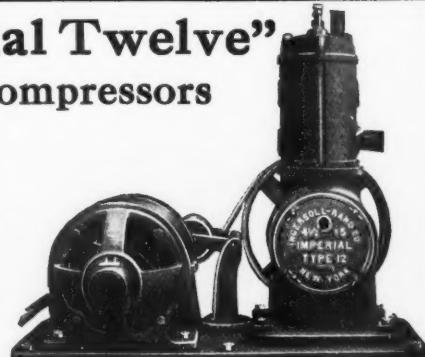
Find out, before you buy a car, whether the maker is solvent and is likely to stay solvent. That's more important than to know the specifications of his car. Look up the maker first. Then find out about cars. We have summed up the present situation in the automobile industry in a booklet that you ought to read before you buy any car. Ask for Book No. 41—it includes car description.

THE WINTON MOTOR CAR COMPANY
424 Berea Road, Cleveland, O.
World's First Maker of Sixes Exclusively

"Imperial Twelve" Garage Compressors

A high-class car equipment deserves high-class garage equipment. The quality of these little compressors is such as to appeal to the most discriminating buyers.

Booklet 608



Ingersoll-Rand Co., New York, London

Every Automobile and Garage Owner or Operator

should possess a reliable, durable, convenient Electrical Measuring Instrument



WESTON MODEL 280
Portable Testing Instrument

Weston Miniature Precision Ammeters and Voltmeters

FIT THE POCKET

and are in every way the most accurate, durable, reliable and altogether satisfactory for testing batteries and electrical circuits.

Send for 30-page bulletin No. 8 describing these and other small instruments.

Weston Electrical Instrument Co.
NEWARK, N. J.

New York Philadelphia Boston Denver Birmingham Montreal
Chicago Boston San Francisco Cleveland Toronto Paris Berlin
St. Louis Detroit London Berlin



A Special Spark Plug For Your Car

We make special models for the Ford, the Pierce-Arrow, the White, the Pullman, the Amplex; extra long shanks for the Buick, the Overland, the Maxwell, the Pope-Hartford; and three standard models— $\frac{1}{4}$ -inch, $\frac{3}{8}$ x 18 (ALAM) and metric—which meet the requirements of all other motors.

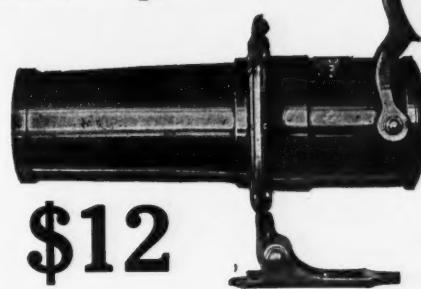
HERZ PLUG has Double, Unbreakable Stone Insulation (Blue Enamelled) and Four Sparking Points of Platinum-alloy. It is Self-cleaning and Guaranteed a Year

We also make the HERZ MAGNETO

HERZ & CO.
295 Lafayette St., New York.

MOTOPHONE

The Hand Operated Horn



\$12

NO Adjustments **NO Electrical Wiring**
Battery Troubles **NO Battery Expense**

Saves Its Initial Cost in Four Months

The Motophone has taken the place of the Motor Horn just as the motor horn took the place of the Bulb Horn.

Today Motophone stands head and shoulders above all other Warning Signals.

Manufactured and guaranteed by

AUTOMOBILE SUPPLY MFG. CO.
220 Taaffe Place Brooklyn, N. Y.

The Vulcan 27

"The World's Greatest Light Car"

~~SIMPLEX AUTOMATIC
TOP LIFTER~~

Raises or lowers top in one minute.
(Record operation, 60 seconds.)
Lifter handles one side, you the other.
Top can't slip—Bow can't break.
Simple—Strong—Necessary.
Dealers—They sell as fast as you can demonstrate. Write.

Cox Oxygen Carbon Remover

COMpletely cleans all cylinders of every minute particle of carbon deposits,—in few minutes. Harmless, thorough, efficient.

Of infinite value to garages,—can pay for itself in one week and produce good profits thereafter. Affords a big saving to taxicab, motor truck and large private owners.

Write for Details

COX BRASS MFG. CO., Albany, N. Y.

FINISHED CRANK SHAFTS
COMPLETE CONNECTING RODS
COLD DRAWN STEEL SHAFTING

SALISBURY

AXLES WHEELS TRANSMISSIONS

The Best Set Is Cheapest at Any Price.
That Set Is the

Bay State Autokit

REFINED IN EVERY DETAIL.

Two Sizes
\$10 \$7.50

Costs no more than inferior sets, but it satisfies twice as well.



Will reach any nut or bolt on any car, and turn it either way.

Ask your dealer or write us.

GEO. A. CUTTER, SALES AGENT Taunton, Mass.

GET THIS AUTO TIRE BOOK FREE

Here is a handy little book brimful of practical points which every automobile owner wants to know. Gives all kinds of information about tires—how to prevent troubles, how to repair best, quickest and at least expense. Tells about the wonderful machine, the

SHALER Electric Vulcanizer

"It Makes One Tire Outwear Three." The Shaler repairs any kind of puncture, cut, blow-out or tear in any outer casing or inner tube. Automatic—makes a perfect weld. Never burns or unburnes. For garage or home use, direct or alternating current, or for road use with alcohol. \$10 up. Costs 1/2¢ per hour to operate. Absolutely guaranteed. **Send Your Name Today** and we will mail our interesting tire book "Care and Repair of Tires." Gives a remedy for every tire emergency. It's free postpaid.

Garage and Repairmen should also write for our money making hand book.

C. A. SHALER CO., 246 4th St., Waupun, Wis.



Braender Tires & Tubes

are cheapest on mileage

They are strictly high-grade—built to outlast all others—and they do it. Ask any user.

Send for price list and full particulars

Established Agents Solicited

BRAENDER RUBBER & TIRE CO.

Main Office and Factory

RUTHERFORD, N. J.

Salerooms: 1987 Broadway, N. Y.

Bull Dog Non-Skid J. R. Johnson, Agent, Greenwich, Conn.

\$60.00 A Year Saved In Tires

That's only one of the savings now offered motorists by the already well known



TAYLOR
"NOIL"
TIRE PUMP

An engine driven tire pump that adds to life of tires by keeping rubber-rotting oil and oily vapor out of the tube. No oil to get in. Also saves an endless amount of back-breaking pumping by HAND! Engine does it all. That's the other advantage. The only pump made with diaphragm and plunger. The one pump that CAN be easily applied! Special bracket for your own car furnished together with hose, tire gauge, etc.

Write Today for Circular

In writing, please give make, model and year of your car.
TAYLOR MFG. CO., P. O. Box 485 A-L, Chicago, Ill.

BUDD ALL STEEL BODIES

represent the last word in the art of truck body building. They stand for strength, stability, sturdiness and efficiency. Made entirely of steel, they will not rot or crack. They cannot warp or split. They will stand the maximum use or abuse and are practically indestructible. They eliminate fire risk. They are light in weight and easy on tires—pleasing in design and attractive. Summed up in a word, they give the highest degree of Service.

They are made in many styles—of any desired capacity. Estimates promptly furnished. Write us today for full information.

Edward G. Budd Manufacturing Co.

Ontario and 1 Streets Philadelphia, Pa.
Detroit Office and Showroom, 796 Woodward Ave.

The Practical Gas & Oil Engine Hand-Book

By
ELLIOTT BROOKES

Author of
"The Automobile Hand-Book"

THE CLASS JOURNAL CO.
916 S. Michigan Ave., Chicago

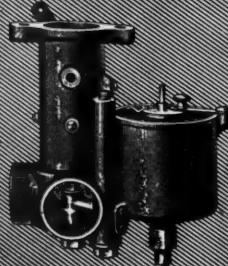
THIS work gives full and clear instructions on all points relating to the care, maintenance and repair of Stationary, Portable and Marine, Gas and Oil Engines, including How to Start, How to Adjust, How to Repair, How to Test.

This book has been written with the intention of furnishing practical information regarding gas, gasoline and kerosene engines, for the use of owners, operators and others who may be interested in their construction, operation and management.

Pocket size
4 x 6 1/4, 200
pages. With
numerous
rules and
formulas, and
over 50 illus-
trations.

Edition De Luxe
Full Leather
Limp
\$1.50

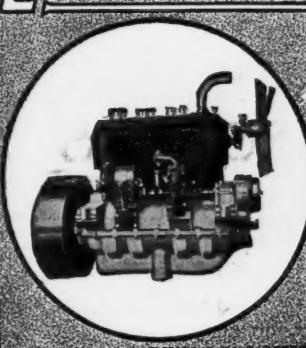
A manual of
useful information
on the care, main-
tenance and re-
pair of Gas
and Oil En-
gines.



Gives
Standard
Carburetion

ZENITH CARBURETOR CO.
DETROIT, MICH.

When Writing to Advertisers, Please Mention Motor Age.



Continental Motors
A WORLD STANDARD FOR QUALITY AND SERVICE
4 AND 6 CYLINDER TYPES
Continental Motor Mfg. Co. DETROIT, MICH.
FACTORY REPRESENTATIVE J. F. PETERSON 122 S. MICHIGAN AVE. CHICAGO



Western Electric
PITTSFIELD
IGNITION APPARATUS

Contributes to the Pleasure of Motoring

PITTSFIELD SPARK COIL CO., Mfrs.
WESTERN ELECTRIC COMPANY
New York and All Principal Cities

B. A. Gramm's Motor Trucks

Newest Designs; Latest Improvements; Built in every detail to insure satisfactory and permanent results.

Write for photographs, descriptive literature and the exceptional values we offer you—far beyond all others.

The Gramm-Bernstein Co.
Exclusive Motor Truck Builders
Lima, Ohio, U. S. A.

American Axles

Found only on high grade cars

THE AMERICAN BALL-BEARING CO.,
Cleveland, Ohio



Shock Preventer

A scientific, mechanical triumph. NOT FRICTION, but graduated resistance of rubber discs according to road conditions. Made in sizes to fit any car.

They are being rapidly adopted by car builders as standard equipment and by car buyers everywhere. Ask us to prove this.

If you are interested in eliminating bouncing and saving tire and repair bills, write today for Booklet "N".

The Aristos Co., 250 W. 54th St., N.Y. Send for Free Sample Mondex Polish

Brixtson Pneumatic Tires

At last the pneumatic tire problem has been virtually solved—the weak points in previous tire construction have been eliminated. The resiliency of a Brixtson Pneumatic Tire puts it in a class by itself. It is Puncture-proof—Blowout-proof—Skid-proof—Rut-proof—Rim-cut-proof—Oil-proof and Gasoline-proof.

Ten Days' Free Trial

To remove all doubt that might arise in the purchaser's mind and to back up our statements—we will allow 10 days' free trial on the first set that goes into each town.

Your Tires Can Be Made Like This

If you are not in need of new tires and the fabric in your present tires is still good—we can rebuild them the Brixtson Way—making them Puncture-proof, Non-skidding, Blow-out-proof, Rut-proof, Oil-proof and Rim-cut-proof. Write today for full particulars, giving your dealer's name.

THE BRICSTON MFG. CO.
12113 Brixtson Bldg.,
Brookings, So. Dak., U. S. A.



You'll bring your motor car up-to-date quickly and inexpensively by installing

Apelco Electric Lights

"The right way to light the way"



It's an electric lighting system that is dependable and reliable, has a light that will penetrate fog and dust as well as darkness. You can get a full description of this lighting system by writing to

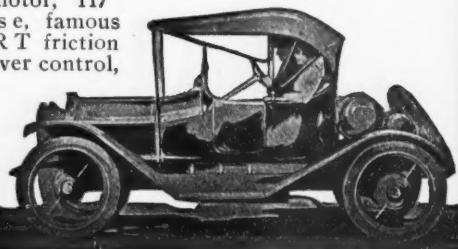
THE APPLE ELECTRIC COMPANY
67 Canal St. Dayton, Ohio



The LAMBERT Model 99 (5-passenger touring car or 2-passenger roadster) at \$1365 (fully equipped) stands

at the head of its price class. It comprises 4½x5¼ Rutenber motor, 117" wheelbase, famous LAMBERT friction drive, one lever control, etc. Write for catalog.

BUCKEYE MFG. CO.
ANDERSON, IND.



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KINGSTON CARBURETORS

Save Money by Economizing Gasoline

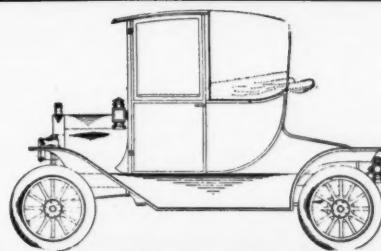
Five floating bronze ball valves opening automatically under different motor suction supply a uniform mixture at any speed, regardless of hot, cold, wet or dry weather.

Write for details and let us tell you why so many manufacturers are adopting this carburetor as standard equipment.

Made by the oldest manufacturers of carburetors in America

ESTABLISHED 1895

BYRNE, KINGSTON & CO., Kokomo, Ind.



A Low Priced Landaulette Coupe for Ford Model T

Light, durable, well designed, comfortable, with folding top. A practical body for all seasons.

Write today.

Irvin Robbins & Co., 10th and Canal, Indianapolis, Ind.



Model T Runabout.....\$500

Model T Touring Car..... 550

Model T Town Car..... 750

With Full Equipment f. o. b. Detroit

FORD MOTOR COMPANY
Detroit, Michigan



When you buy SCHAFER BALL BEARINGS you are not experimenting because SCHAFER BALL BEARINGS have for years been recognized as the standard of bearing quality. They are made in Germany of the best steel and are now in universal use throughout the world

BARTHEL & DALY

42 BROADWAY

NEW YORK

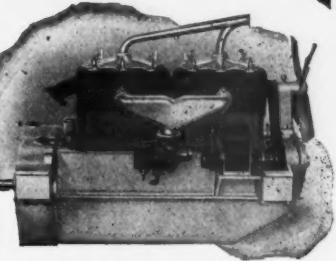
Wisconsin Motors

ROAD CHAMPION OF AMERICA

The Tacoma, Santa Monica, Elgin and Corona road races were won hands down by Stutz cars equipped with the consistent Wisconsin Motor—the drivers never raising the hood. Winning all these big road events of the year has accorded Wisconsin Motors the title of Road Champion of America. Write for catalog describing the following sizes:

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|---------------------------------------|--------------|--------|
| 8 $\frac{3}{4}$ " x 5" | , 4 cyl..... | Enbloc |
| 4 $\frac{1}{2}$ " x 5" | , 4 cyl..... | Enbloc |
| 4 $\frac{1}{2}$ " x 5" | , 4 cyl..... | T Head |
| 4 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " | , 4 cyl..... | T Head |
| 5 $\frac{1}{4}$ " x 7 $\frac{1}{2}$ " | , 4 cyl..... | T Head |
| 8 $\frac{3}{4}$ " x 5 $\frac{1}{2}$ " | , 8 cyl..... | Enbloc |
| 4 $\frac{1}{2}$ " x 5" | , 8 cyl..... | Enbloc |
| 4 $\frac{1}{2}$ " x 5" | , 8 cyl..... | T Head |
| 5 $\frac{1}{4}$ " x 7" | , 8 cyl..... | T Head |

Wisconsin Motor Mfg. Co.
Dept. 25 Milwaukee, Wis.



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ANNOUNCEMENT

For the convenience of owners whose cars are not regularly equipped with Rajah Clip Terminals we are now furnishing—

A Thumb Nut Terminal with each $\frac{1}{4}$ -inch and Metric Rajah Plug.

A Thumb Nut and Stud Terminal with each $\frac{1}{8}$ x 18 Rajah Plug.

Rajah Plugs can be used on any motor and with any other make of terminal with our special adapters.

The Packard and Ball Terminals are furnished only on special request or in exchange.

Send for our 1914 Catalog.

RAJAH AUTO SUPPLY COMPANY

Bloomfield, N. J.

John Millen & Son, Limited
Montreal, Toronto, Vancouver, Winnipeg



Use POLO Pneumatic

Rim Cutting
Entirely Done
Away
With



Tire Alarm

Heavily Nickelated

Thoroughly Tested
and Guaranteed

Easily and quickly attached to valve stem, they take the place of the cap. Compactly made and reduced to the smallest possible size compatible with strength and durability.

Prevents Rim Cutting
Lessens Blow-Outs and Blisters
Running on low air pressure shortens the life of a tire more than any other cause. The Polo Pneumatic Alarm advises you instantly when the pressure falls below a given point, by giving vent to a shrill whistle. We invite inquiries from dealers and auto users.

Write for descriptive folder
POLO PNEUMATIC ALARM MFG. CO.
CLEAR LAKE, SO. DAK

Cut Gears of Quality Complete Differentials

NEW PROCESS GEAR CORPORATION
SYRACUSE, N.Y.

BROWNIE BLOW-OUT CHAIN

*The best and most practical
on the market*

Gives you thousands of extra
mileage



3 $\frac{1}{2}$ inch.....\$1.75

4 inch.....2.00

4 $\frac{1}{2}$ inch.....2.25

5 inch.....2.50

5 $\frac{1}{2}$ inch.....2.75

Sent postpaid to any part of the
United States

HALLIWELL CO.
408 West Pico St.
LOS ANGELES, CALIFORNIA

A FULL ELLIPTIC BROKEN—Bridged over and supported by the KANTALEVER EMERGENCY SPRING REPAIRER



Price
\$3.50

(Patented)

Keep your car running regardless of broken springs. The applying of a

KANTALEVER EMERGENCY SPRING REPAIRER
to any broken spring, no matter where broken, will carry the usual load of the spring for an indefinite period.

THE MOTOR CAR EQUIPMENT CO.
55-C Warren Street Manufacturers NEW YORK CITY

SUSPENSION BALL BEARINGS

The arrows on the cross section show how the load is evenly carried by upper as well as lower balls, making the only perfectly balanced radial bearing, and at the same time an ideal thrust bearing. This Double Row Ball Bearing will carry a greater load than any other ball bearing.

Races made from solid, special analysis steel. Specially selected alloy steel balls. Maximum size and greatest number of balls. Greatest bearing surface between race and balls. Closest limits of guaranteed accuracy.

Now used in motor cars, machinery, and to equip our Special Shaft Hangers. We also make plain and grooved thrust bearings.

WRITE FOR BOOKLET M

SUSPENSION ROLLER BEARING CO., Sandusky, Ohio

Dorris
Built to last

THE SILENT CAR

BUILT TO LAST Attention, Agents!!

We are offering a big, liberal proposition and unusual sales help to Agents on the

1914 Dorris Truck & Pleasure Car
We sell "through" the dealer and not "to" him. Write today.
DORRIS MOTOR CAR COMPANY

St. Louis, Mo.

RAYFIELD
CARBURETOR

More power - Less fuel - Wider range

FINDEISEN & KROPF MFG. CO.
21ST & ROCKWELL STS., CHICAGO, ILL.

AJAX

Mileage Contest

\$5000 in Cash Prizes

For full particulars address

AJAX-GRIEB RUBBER CO.
1796 BROADWAY, NEW YORK

Herreshoff Electric Self-Cranking Electrically Lighted Four Forward Speeds

The Herreshoff six was the first light six built and is today conceded the best example of skillful design in combining strength with reduced weight.

"Six-Forty" Touring Car and Roadster \$1850 - 7 Passenger \$1900

| | | |
|--------------------------|---|--------|
| Model 4 - 30 Touring Car | - | \$1350 |
| Model 4 - 30 Coupe | - | \$1650 |
| Model 4 - 30 Roadster | - | \$1250 |

Live-Wire Dealers Write for Unallotted Territory.

HERRESHOFF MOTOR CO., Detroit, Mich., U.S.A.

The Thoroughbred Car

EISEMANN

The performance of Eisemann Ignition Systems during the Indiana-Pacific Tour justifies every claim we have ever made for Eisemann efficiency and dependability.

The Eisemann Magneto Company
Sales and General Offices
225-227 West 57th St., New York
Indianapolis, Ind.
514 North Capitol Ave.
Detroit, Mich.
802 Woodward Ave.

\$1490!

The New Auburn "40" is 1914's startling value—a large, beautiful, 120-inch wheelbase car, equipped with every luxury and convenience of high-priced cars. At \$1490!

NOTE THESE ADVANCED FEATURES:

Left Drive
Center Control
Electrically Self-Cranked
Electric Lighted
Electric Horn
Rain-Vision Ventilating Windshield
36x4 Tires; Demountable Rims
Full Floating Rear Axle
Cowl Dash

Turkish Type Upholstery—Finest of Leathers
Wide Doors (with concealed hinges) as on 1914 European Cars
Dustproof En-Bloc T-Head Motor
Extra Roomy Tonneau—29 inches
Foot Room
Tire Irons with Extra Demountable Rims

Write for new, complete descriptive folder to

AUBURN AUTOMOBILE COMPANY, Auburn, Ind.

HESS AXLES

HESS Axles have been on the market but 2 years. Fourteen car manufacturers in that short time exclusively adopted them as regular equipment.

Renewals of HESS contracts for 1913 from past users and an increasing HESS demand among new manufacturers, is ample proof of the stability of HESS Quality.

May we be of service to you? Write us.

THE HESS SPRING & AXLE COMPANY
Carthage, Ohio, U. S. A.

\$5 Buys this Benefiel Automatic Auto Gas Liter—Complete, ready to install

Delivered Prepaid to your address by Parcel Post or Express

LIGHTS and regulates your gas lamps from seat every time At this undreamed of low price, all the convenience of electric lighting combined with the safety and dependability of gas lighting

No more matches, borrow a spark from your motor. This neat, safe, dependable Gas Liter operates with every convenience from the driver's position. One-half turn of a small disc on your dash lights and automatically regulates the flame at the height you desire. Finished handsomely—gives a distinct appearance to your regular car equipment. Installed on your car in one hour. Sold for a limited time only at the introductory price of \$5.00. PAY A \$5 BILL TO YOUR LETTER and mail it at once. This low price absolutely can not be maintained regularly. If your car is now lighted by gas this liter will return its small cost to you many times over in time and trouble saved. Guaranteed or your money back.

Descriptive literature gladly mailed. Dealers and Local Representatives write for Agency offer with exclusive territory.

CHAS. E. BENEFIEL CO. Inc. Box A, Industrial Bldg. INDIANAPOLIS, IND.

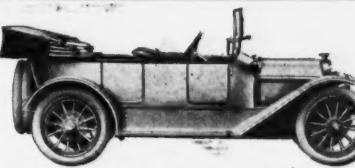
THE TUGBOAT OF LAND COMMERCE"



KNOX AUTO CO.,

SPRINGFIELD,
MASS.

Type 35
Series
G and H



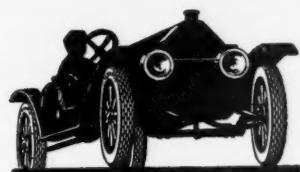
Electric
Starting
and
Lighting

MERCER

The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

Write today regarding unallotted Territory

MERCER AUTOMOBILE CO., 800 Whitehead Road, TRENTON, N. J.



If he has Republics on his car

you can rest assured he's a good "buyer." He knows that first cost is the last item to consider in tire buying, that quality counts most—quality in material, in design, in workmanship.

The Republic Rubber Co., Youngstown, O.
REPUBLIC STAGGARD TIRES TREAD

Republic Staggard Tread, Pat. Sept. 15-22, 1908

TUTO
2-TONE
HORN

Electrically transmits two different and distinct sounds; the degree of sound being regulated by the pressure of the thumb upon one button located on the steering wheel. One tone gives polite notice, the other says "Danger!" in unmistakable terms. Complete with button and cord, \$15.00. Elyria-Dean products manufactured only by

THE DEAN ELECTRIC COMPANY
2504 OLIVE STREET ELYRIA, OHIO, U. S. A.

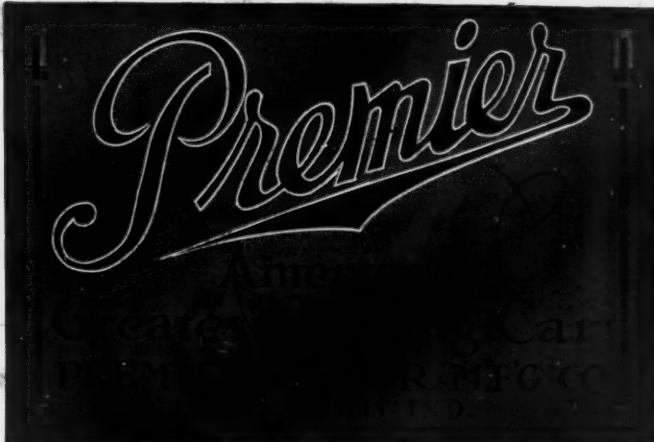
"Look for Elyria-Dean where Quality's seen."

KEETON
DETROIT U. S. A.

"SIX-48"
\$3250
Fully
Equipped
Riverside Touring Car

Write
for
Booklet

KEETON MOTOR CO.
DETROIT U. S. A.





MOTOR CARS

5-Passenger Touring
F. O. B. Detroit.....\$2485

S. & M. MOTOR CO., Inc., Detroit, Mich.
Metropolitan Distributors. Diamond Warren Motor Co., Inc.,
2002 B'dway, N. Y. Southern California Distributors,
Aston Motor Car Co., Los Angeles.

Every Part Is Standard and the Best in Quality

Strong Features:

Continental Six-Cylinder Motor.
Timken Axles and Bearings.
Brown-Lipe Transmission.
Gemmer Steering Gear.
Jesco Lighting and Starting.
Warner Speedometer.

Mayo Honeycomb Radiator.
Mott Wire Wheels.
Rostand Windshield.
Full floating rear axle, aluminum, hood, 130 in. wheelbase, left hand drive, etc.

HAYWOOD STEAM VULCANIZERS THE PROFIT MAKING PLANTS



The vulcanizing system that DOES NOT use air bags. SOLID PADS and HEAVY CLAMPS are the means through which pressure is generated.

Plants from \$25 to \$500

Write for Catalog B.
HAYWOOD TIRE & EQUIPMENT COMPANY
524 N. Capitol, Indianapolis, Indiana

Argo Electrics

have established the standard of electric car construction for all time to come.

Write for Dealer's Proposition

"Creating for the Future—
Not Rebuilding from the Past."

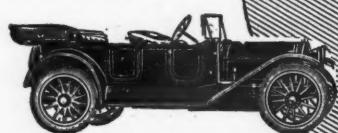
METZGER - HERRINGTON ARGO COMPANY
Distributors
2412 Michigan Avenue, Chicago
FACTORIES: SAGINAW, MICHIGAN

The 6-Cylinder, Reasonably Priced



The car with a stronger appeal than any recent product of the trade—the one that meets a popular demand. We have an unusually attractive proposition for dealers. Write at once for free catalog and full particulars.

Sells for
\$2,185



de Soto Motor Car Company, Auburn, Ind.



Keeps out LIGHT and OIL and will add to the appearance of your car and the life of your casings. Easily applied, not sticky.
Quarts .75 cents. Gallons \$2.75
Write for special dealers proposition.

THE CHIEFTAIN MANUFACTURING COMPANY,
CHARLESTON-KANAWHA, W. VA.

UP-TO-THE-

minute gasoline car dealers no longer dread the "dull" season. Business is good; profits keep coming in the year around for THEM. Why not for YOU? Think what the extra revenue from the sales of the Borland Electric would do for YOUR business! For this is the most

The Borland Electric

extensively advertised electric of them all; the car with ALL the BEST features. Easy to sell—sure to satisfy; backed by enviable financial strength. 5-passenger coupe, list price, \$2,900; open-body, wheel-steer roadster, \$2,550. Liberal local advertising assistance.

Perhaps your territory is still open. Write or wire us today for liberal agency proposition and dealer discounts.

THE BORLAND-GRANNIS COMPANY
310 East Huron Street
Chicago, Illinois

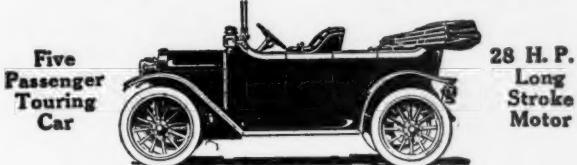
United States Tires
are good tires

They cut down tire bills

Manufacturers of 1914 Models
Fan from your 1914 specifications. Our One-Piece blade, ball-bearing, radiator fan assemblies cool the motors of more high-class cars than any other fan on the market. There's a reason. SPARKS-WITHINGTON Fans deliver the greatest volume of air with the least H. P. consumption of any fan obtainable. Furthermore, their one-piece construction is positive insurance against blades which loosen, become detached and fly off. Get in touch with us.

The Sparks-Withington Co.
JACKSON MICHIGAN - WALKERVILLE CAN.

The Detroiter — \$850 and \$900
Completely Equipped



Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Rear Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car

BRIGGS-DETROITER COMPANY, 455 HOLBROOK AVE., DETROIT, MICH.
WRITE FOR SPECIFICATIONS

Mosler Spit Fire Plugs
are the BEST

FOR 13 YEARS HAVE BEEN LIKE THIS

INSIST ON OUR
GENUINE PLATINUM POINTED PLUGS

A. R. MOSLER & CO.,
P. O. BOX "M", MT. VERNON, N.Y.



The Searchlight Gas Co.

1016 Karpen Building

CHICAGO, ILLINOIS

Stronger than ever, legally, financially and in the esteem of the trade. Watch us grow.

BRANCHES AND REFILLING STATIONS:

Warren, Ohio
Chicago, Ill.
Detroit, Mich.
Camden, N. J.
Philadelphia, Pa.
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San Francisco, Calif.
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Dallas, Texas
San Antonio, Tex.
Boston, Mass.

New York City
Syracuse, N. Y.
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S. R. O.
Ball Bearing



Mea Magneto

Sole Importers

MARBURG BROTHERS, Inc.
1790 Broadway, New York

Detroit Toronto Chicago

Marmon "Thirty-Two"

Four-cylinder, 32-40 h. p., 120-inch wheel base, body types and equipment to meet every requirement. A rational, logical car for touring and city use. Years of satisfactory service have proved its economy in tires, fuel and upkeep — plus smooth, delightful operation and durability.

Price, \$8,000.

"The Easiest Riding Car in The World"
NARMON
Nordyke & Marmon Company
(Established 1891) INDIANA

Six-cylinder, 48-80 h. p., 145-inch wheel base with short turning ability, eliminating the old objections to long wheel base. Body types and equipment to meet every requirement. The only big car with small car advantages. Wonderful riding qualities and surpassing power and flexibility. A car developed by years of exacting tests. Price, \$5,000.

Marmon "Forty-Eight"



Each section 2 in. wide. They hook to rims. Try two or three sections over any old blowout.

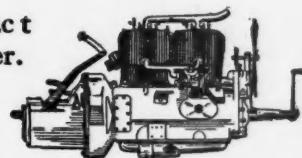
Special Prices
to the First in New Territory
KIMBALL TIRE CASE CO., 173 BOW., COUNCIL BLUFFS, IA.



Ergon Motors are "work" motors. Their Simplicity of design assures long life and ample power.

We never over contract our ability to deliver.

Three models. Model C, 3 3/4 x 4 1/2; model CX, 4 x 4 1/2; model D, 4 3/8 x 6.



ERGON MOTOR
MANUFACTURING COMPANY
INDIANAPOLIS, IND.

COLE

The Standardized Car

The car that started the stampede to standardization

A Cole franchise is a valuable asset to any dealer. Find out about it.



Cole Motor Car Co. of Indianapolis

STAPLEY
TIRE PUMP

Made by Bridgeport Brass Co.

Increases the Life of Tires

The STAPLEY makes it easy to keep tires properly inflated.

It is an efficient Compound pump of the finest materials and workmanship; it is always ready and always works.

Price without Gauge \$4.00 With Gauge 6.00

THE BRIDGEPORT BRASS COMPANY
P. O. Station A Bridgeport, Conn.



Six Cylinder, 65 H. P.
Equipped with Vulcan
Electric Gear Shift.

Four Cylinder, 40 H. P.
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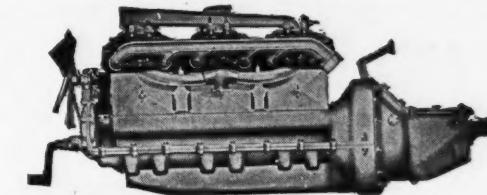
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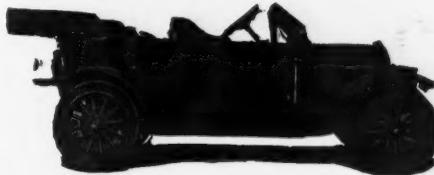
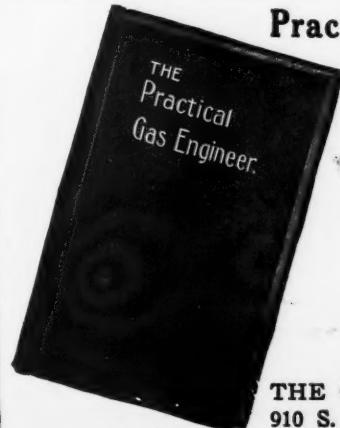
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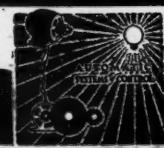
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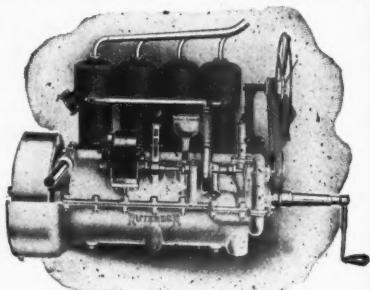
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R. E. Olds' famous car—the leading car in
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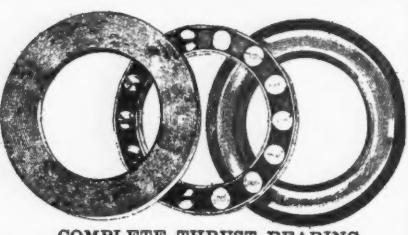
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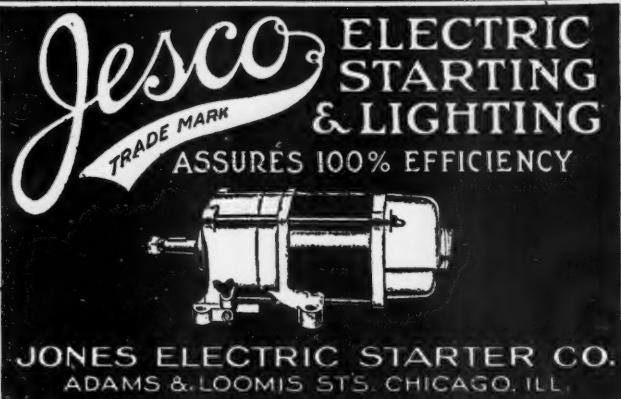
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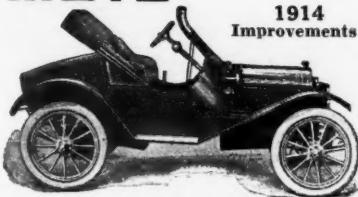
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1914
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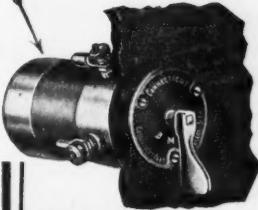
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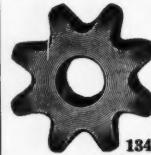
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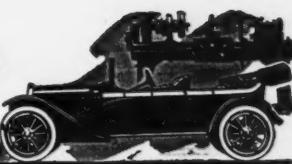
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FOR SALE—NEW MOTOR TRUCK, 2 TO 3 ton, 40 H. P., 4 cylinders stake body; cost \$2,500 take \$1,500. Will guarantee. Box D 545, care Motor Age. b

FOR SALE—OLDSMOBILE LIMITED; JUST the car for the man in the motor livery business; seeing is believing; come in and look it over and make us an offer. Springfield Branch of Stevens-Duryea Company, 147 Chestnut St., Springfield, Mass.

FOR SALE—ONE 6-CYLINDER, 7-PASSENGER, 1913 Mitchell, with electric starter and electric lights; bought new July 5; run 2,000 miles; tires new; a bargain; cost \$2,500; our price, \$1,400. COLE MOTOR COMPANY OF MISSOURI 1512 Grand Avenue, Home phone, Main 1502. Bell phone, Grand 1500. Kansas City, Mo.

FOR SALE OR TRADE—60 HORSEPOWER car, double chain drive; would make a 2-ton truck. E. B. Collins, Danville, Ill.

FOR SALE—SECOND-HAND TRUCKS.
4 Decatur 1½-ton trucks.
1 Randolph ¾-ton truck.
1 Rapid 1-ton truck.
1 5-passenger Corbin touring car.
2 500-lb. light trucks.

Apply to L. W. Coppock at old plant Grand Rapids Motor Truck Co., Grand Rapids, Mich. Phone Citz. 7487.

GARFORD SEVEN PASSENGER CAR, factory overhauled and in perfect order; 1911 model. For quick sale, \$1,000. Robt. Holmes & Bros., Danville, Ill.

HUPMOBILE 32 H. P. TOURING CAR, fully equipped, run 2,500 miles. LIKE NEW—CONDITION GUARANTEED. Snap to quick buyer. T. Sherow, Millbrook, N. Y.

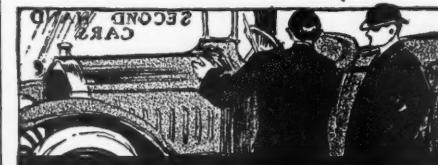
INSTALL AT ONCE BUICK 30, 1913 RUNABOUT, 36 H. P., electric lights, extra tire, gray; run under 1,000 miles; first set tires O. K.; cost \$1,225; sell \$900. For particulars address Pearl D. Fife, Unionville, Mo.

I AM OBLIGED TO SELL MY 90 H. P. Oldsmobile Limited Racing Roadster, speed 85 miles per hour. It is built low, equipped with 38x4½ tires on demountable rims, tires new with two extra carried on rear, large gasoline tank, also oil tank. Every part of this car guaranteed in perfect condition. This is the classiest speed car in the country and is a bargain for quick sale. Send for photo.

P. O. Box 565, Louisville, Ky. s

MITCHELLS, REBUILT, GUARANTEED. These cars are fully equipped. Call or write for further particulars. Mitchell Automobile Co., 2334-36-38 Michigan Ave., Chicago.

PACKARD TOURING. Seven-passenger, completely equipped, just overhauled and repainted; all worn parts replaced; absolutely A-1 condition; has new 1913 fore doors; tires practically new; 2 extra cases; 5 tubes; make an offer. Hoffman Garage, Bedford, Pa.



A Good Reason

"We do not care to repeat the advertisement in reference to the Knight car at this time. We sold it through the MOTOR AGE advertisement. That's why." H. H. W.

PIERCE FOR SALE—1910 "48" SEVEN-PASSENGER TOURING CAR, motor just overhauled at factory, new tires, seat covers and Klaxon horn, entire car in excellent condition—cheap for cash. Owner has purchased Ohio electric, reason for selling. Blake Auto Co., Colorado Springs, Colo.

Parts and Accessories FOR SALE

ACCESSORY CATALOG MAILED ON REQUEST. Maxwell dealers and owners, we can supply tops, shields, etc., for your cars. Lowest prices, all goods. Write us. Westchester Accessories Co., 1777 Broadway, N. Y. City.

ATTENTION—HENRY OWNERS

Having purchased the repair business of the Henry Motor Co., we are prepared to fill orders promptly for repairs for Henry cars. Muskegon Automobile Co., Muskegon, Mich.

AUTO BODIES, WINDSHIELDS, WHEELS. 250 new panel top delivery bodies, some panel top, some open express with flare boards. Will fit three-fourths of autos made. \$28 to \$45. Folding plate glass windshields. \$10 complete. New 32-inch wheels with solid rubber tires, only \$12 each. Benedict Co., 63 Winder St., Detroit, Mich.

A-1 RADIATORS

A stronger, better and fine appearing radiator, not a rebuilt or cheaply constructed job.

WE GUARANTEE IT NOT TO LEAK THROUGH FREEZING OF WATER FLOWS

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|-------------------------------------|---------|
| Ford T (special construction) | \$20.00 |
| Ford T (honeycomb type) | 30.00 |
| Overland 69 | 30.00 |
| Buick 10 | 26.00 |
| Buick 16-17 | 31.00 |
| Hudson 20 | 30.00 |
| E-M-F 30 | 28.00 |

Prompt delivery. Terms, 2 per cent discount for cash with order, or one-third cash balance C. O. D. Get our quotations on those not listed. We can make any radiator.

DETROIT RADIATOR & SPECIALTY CO.

963 Woodward Ave., Detroit, Mich.

ATTENTION, WHITE STEAMER OWNERS! One Model "M" engine complete; one Model "O" engine complete; one Model "F" and "L" crankshaft complete; generators, burners, axles, wheels, springs and numerous other parts for any model cheap; also one fine straight line, seven passenger body and one seven passenger limousine body cheap; one good seven passenger White Steamer with kerosene burner, \$250; a snap. Address Box D 551, c/o Motor Age. w

A WHITE STEAMER, GENERATOR AND BURNER, almost new. Will sell cheap. Address Box D 245, c/o Motor Age. w

AUTOMOBILE OWNERS. Send for our latest illustrated cut price catalogue of automobile accessories. Liberty Tire Co., 102 Chambers St., New York City.

AUTO PARTS MAKERS. Repair and service parts for many cars. We own all patterns and parts in stock for Elmore, Warren, DeMott, Welch, Rainier, Marquette, De Luxe and other cars. Complete stock.

Puritan Machine Company, Detroit, Mich.

BALL & ROLLER BEARINGS.

All Types and sizes. We also repair or exchange all makes of ball bearings.

THE GWILLIAM CO., 253 W. 58th St., N. Y.:

1314 Arch St., Philadelphia.

BARGAINS.

Viso spark plugs; a glance shows missing cylinder; solves ignition troubles. Sample mailed on receipt of 25¢. Storage batteries \$7.50 to \$16.00. Electric head lamps only \$7.50 pair.

The Ampvo Battery Co., 3031 Michigan Ave., Chicago, Ill.

BARGAINS—BARGAINS—BARGAINS

Is the only thing we handle, from a cotter pin to a complete car. Small and high-powered cars, engines, frames, bodies, axles, radiators, transmissions, magnetos, tops, etc. Before buying let us quote.

Pacific Motor Car Exchange Company, 10 West 62nd St., New York.

BERGDOLL REPAIR PARTS.

The repair business of the Bergdoll cars, together with all drawings, jigs, patterns, etc., has been purchased by us. We have a complete stock of repair parts for all models on hand and orders for parts for Bergdoll cars should be placed with us direct to save time.

Louis J. Bergdoll Motor Co., 124 N. 3rd St., Philadelphia.

COMPLETE "VULCAN PROCESS"
of oxy-acetylene welding
plants from \$175 for the blacksmith and
garage plant up to largest made. Torchlight
weight. No backfiring in ordinary work.
Write today for our booklet on welding.
Vulcan Process Co.,
25th and University Ave., S. E.,
Minneapolis, Minn.

CUT-OUTS.
E.M.F., Flanders, Buick, Regal, etc. Complete
outfit with brass lock open pedal, \$1.50.
Lincoln Machine Shop, Lincoln, Ill.

DOES YOUR MOHAIR AND CANVAS TOP
leak? Coleman's Waterproof Filler will
make it rainproof. It will not stiffen or
change the color. Virginia Waterproofer
Corp., Arcade Bldg., Norfolk, Va.

DRAGON REPAIR PARTS.
We manufacture and keep on hand all re-
pair parts for the Dragon cars. We make a
specialty of repairing this machine. Phila-
delphia Machine Works, 67 Laurel St., Phila-
delphia, Pa.

FORD AND ACCESSORY DEALERS.
We are now giving our entire attention to
the best accessory that can be put on a FORD
CAR. Our special Ford Foot-Throttle is the
simplest on the market and quickest to in-
stall. Write now and do your thinking when
you see our prices. Peoria Accessory Co.,
Peoria, Ill.

FORD CAR WIRE WHEELS.

Demountable wire wheels interchangeable
all around, built especially for Ford cars.
Five wheels to a set, enabling you to carry
spare wheel with inflated tire, and make
quick change.

THE F. & H. WIRE WHEEL CO.,
Columbus, Ohio.

FORD FAN BELTS, WOVEN COTTON AND
silk; outlasts six regular belts. Postpaid,
60c. Dealers write. Angier's, Streator, Ill.

FORD, HUPP AND MAXWELL
Muffler cut-out, machined ready to attach,
including lock open pedal string and cables,
\$1.35. Lincoln Machine Shop, Lincoln, Ill. o

FORD LIGHTING OUTFITS, \$5.50.
Includes parabolic reflectors, tungsten
bulbs, wiring switch and free delivery.
Truscott Auto Supply Co., St. Joseph, Mich.

FORD OWNERS AND DEALERS!

You will save trouble and money by in-
stalling our timer elevating device.
Ford Parts Specialty Co.,
1211 Main St., Richmond, Ind.

FORD OWNERS—OUR SPARE DEMOUNTABLE
wheel cures tire trouble on road. Doctors,
attention. Write Angier's, Streator, Ill.

FORD OWNERS—WE CAN MAKE YOUR
car the easiest rider made with light or
heavy load; no jolt, no jars, no upthrow.
Write us. Thomas Auxiliary Spring Co.,
Canisteo, N. Y.

FORE DOORS

We are prepared to make prompt shipment
from stock and guarantee the doors to fit or
money returned.

F. E. LORTZ CO.,
1547 So. Mich. Ave., Chicago, Ill.

FORD OWNERS.

Enter your order with us at once and take
advantage of the following bargains while
they last.

| | |
|--|---------|
| Ford Lighting Outfits..... | \$ 5.50 |
| Clamp On Ford Bumpers..... | 4.00 |
| Spark Plugs | .35 |
| Electric Horns, "Electra and Bulldog". | 2.90 |
| Ford Oil Gauges..... | .35 |
| Ford Valve Stem Adjusters..... | 1.25 |
| Tires 30" x 3" New..... | 9.75 |
| Tires 30" x 3 1/2" New..... | 14.00 |

Write for list on other bargains. Terms,
cash with order. Money back if not satisfied.
AUTOMOBILE SUPPLY & MACHINE CO.,
50 Rowland Bldg., Detroit, Mich.

FORD T. OWNERS.

Foot throttle or accelerators, \$1.50. Lin-
coln Machine Shop, Lincoln, Ill.

FOR SALE—STANDARD OPEN BODY FOR
Ford runabout, 1912 model, good condition;
cheap.

Address Box D-565, c/o Motor Age.

FORE-DOORS AT CUT PRICES.

Mr. Auto Owner and Dealer: If your car is
without fore-doors, write today for bargain
prices; to reduce stock.

DEPT. D., AUTO SPECIALTY MFG. CO.,
326-30 E. Market St.,
Indianapolis, Ind.

FOR SALE—CINO RACING MOTOR, COM-
plete with double spark Remy racing mag-
neto, \$175.00. Model N Ford engine and
transmission, \$75.00. Type 17 Buick rear axle
complete, \$50.00; 2-cyl. Davis motor, \$40.00.
Type "17" Buick Transmission, \$35.00. 24-
H. P. Pope Engine, \$50. Pope Toledo parts
for sale.

Auto-Salvage Co.,
1436 Wabash Ave., Chicago.

FOR SALE—ONE \$175.00 BOWSER GASO-
line outfit. Brand new. Will sell at a bar-
gain.

RANDALL MOTOR CAR CO.,
Fort Wayne, Ind.



More Than Satisfied!

"Please change our ad-
vertisement to read as per
enclosed matter. Run until
further notice. We have
steadily secured excellent
results from our ads in
MOTOR AGE and are
more than satisfied."

L. D. S.

FOR THE PROTECTION OF FORDS.

Mr. Ford Owner, it will cost you just \$1.50
to absolutely insure your car against theft.
The Kimball Safety Noiseless Crank-Holder
and Lock holds the crank rigidly in place, se-
curely locked. Figure the cost of the Kim-
ball against a theft insurance policy! Made
of spring steel, neatly enameled, it adds to
the appearance of your car.

IT STOPS RATTLING OF CRANK HANDLE

Easily applied in five minutes, requiring no
alterations in car.

For sale at Ford agencies and garages, or
sent prepaid—including lock—on receipt of
\$1.50.

Responsible Dealers Wanted.

NORTHERN SPECIALTY CO.,
Crystal Falls, Mich.

FOR SALE AT A BARGAIN—NEW 5x6'
four-cylinder, governor-controlled engine,
fully equipped with carburetor magneto. Will
sell for much less than cost.

Hackney Mfg. Co.,
570 Prior Ave., St. Paul, Minn.

HAYNES MODEL W—2ND HAND PARTS
—Practically complete car in parts as
wanted at 25% value. Includes magneto.
No tires or crankshaft. Good condition.

Farm Mutual Tel. Co.,
Grimes, Ia.

"JIFFY" SIDE CURTAINS FOR FORD
cars. Everything complete ready to at-
tach to bows. Touring \$15; Roadster \$12.50.
Price-list curtains for all cars on request.

HERCULES RUBBER CO.,
"Jiffy" Curtain Division,"

No. 2 Hudson St., New York.

FOR SALE.

| | |
|---|----------|
| 36-42 H. P. "L" Head Motors, 4 1/2 x 5 (Continental type), with cone clutch. | \$250.00 |
| Brown and Lipe sub-frame transmission, three speeds forward and one reverse, with shifting quadrants and lever "H" shift. | 50.00 |
| Cone clutches with joint and cross and spring. | 12.50 |
| 18" hand wheel worm and gear steering gears (Gemmer type). | 12.50 |
| Sheldon front and rear axles, shaft drive for car up to 30 H. P. with artillery wheels and demountable rims. | 82.50 |
| A. O. Smith steel frames for 110-inch wheel base. | 10.00 |
| Driggs-Seabury heat treated steel frames for 121-inch wheel base with kick up for three-quarter elliptic springs with all fittings for springs front and rear and standard-size sub frame. | 15.00 |
| Brown and Lipe shifting levers "H" with quadrants. | 12.50 |
| Radiators with bonnet ledge for cars up to 30 H. P. | 11.00 |

Apply to G. J. G. Motor Car Company,
White Plains, N. Y.

LION REPAIR PARTS.

We have on hand a complete stock of re-
pair parts for all models of Lion Cars.
Lion Motor Parts Co.,
124 N. 3rd St., Philadelphia, Pa.

MAGNETOS: WE HAVE 2,000 MODEL X
Splitdorf Magnets, new. Price, without
coil, \$17.50 each; with coil, \$25.00 each.

The regular price of these is \$75.00.

We also have other makes of magnetos at
cut prices—in fact everything for the auto-
mobile. Send for "OUR PRICE WRECKER"
—the greatest money saver in the world.

TIMES SQUARE AUTO CO.,
1210 Michigan Blvd., Chicago Ill.
S. W. Cor. 56th St. & Broadway, N. Y. City.

MAKE CASH OFFER FOR
O. B. PORTABLE AIR COMPRESSOR.

Practically new, suitable private or small
public garage. Bids kept open one month.
Any bid may be rejected. Address Box D 512,
c/o Motor Age.

MAKE YOUR OWN BRASS POLISH AT
very little cost. Send \$1.00 for formula and
complete directions. A big saving for ga-
rages. Robert George, Sargent, Neb.

MORA REPAIR PARTS.

We purchased the repair business of the
Mora Company and have in stock repair parts
for all models of Mora cars.

Philadelphia Machine Works,
67 Laurel St., Philadelphia, Pa.

MR. (FORD) OWNER AND GARAGE MAN.

The Townsman Valve Adjuster has a cushion
for your valve-stems. Takes away the click,
absolutely silencing the valves. No screws or
burrs to work loose. Saves putting in new
push-rods and valve-stems. They never wear
out. Price \$1.50 by mail. Ask your jobber,
or address Townsman Auto Specialty Co.,
Mitchell, S. D.

PAINT YOUR CAR YOURSELF

Save \$25 to \$75 by doing the work at home
with the Arsenal system. Our big free book-
let, "The Car Beautiful," tells how. Send
for it today.

ARSENAL VARNISH COMPANY
Auto Dept., Rock Island, Ill.

PREPARE FOR WINTER.

You will want a Hand Warmer to keep
you comfortable and warm. We have a per-
fect Hand Warmer. They simply lace on
your steering rim. Do not mar the rim;
easy to put on or take off. Fit on any rim
or car. They are comfortable and neat look-
ing. They use very little current. Operate
on current from the Ford magneto storage
battery or lighting system. Sold on the
money-back guarantee. See your dealer or
write us direct.

Motorist Warm Grip Co.,
Marshall, Texas.

RADIATOR COVERS FOR ALL CARS.

Every car should have a radiator cover
in cold weather.

Write for prices.
Auto Cape Top Co.,
2334 Michigan Ave., Chicago, Ill.

MR. DEALER,

ARE YOU BUYING YOUR SUPPLIES
RIGHT?

| | |
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| Herschell-Spilman motors, 6 cylinder | \$275.00 |
| 6 cylinder Briggs magnetos | 18.00 |
| Atwater-Kent Unisparkers | 21.00 |
| 4 cylinder Midland motor with planetary transmission mounted on sub-frame | 100.00 |
| 5 and 7 passenger fore-door Midland bodies, latest model | 25.00 |
| Mohair tops to fit | 18.00 |
| Midland machined valve stems...each | .20 |
| Detweiler steering gears with 18" wheel | 15.00 |
| Midland wheels with Q. D. clincher rims | each |
| Dash gasoline oil pumps, nickel plated, each | 2.00 |
| Olin radiator compound, \$2.00 size, each | 1.00 |
| 2,000 ft. secondary cable, list 20c. per ft. | .50 |
| 10,000 coil springs, assorted sizes...each | .03 |
| 600 ft. 1", 1 1/4", or 1 1/2" aluminum flexible tubing for carburetors...per ft. | .02 |
| Door handles, brass or nickel...each | .20 |
| Midland fenders, enameled, will fit most any car | 1.00 |
| Baker demountable rims, 34x4, Q. D. and clincher | each |
| Aluminum running board moulding, per ft. | .10 |
| 40 set 34x4 demountable wheels, per set | 18.00 |
| 250 set Weston-Mott semi-floating shaft drive rear axles complete with hubs, drums, caps, front axle, rear axle, demountable wheels, 32x4 or 34x4 | 50.00 |
| 300 Stewart-Warner speedometers, Model 11, any finish | 12.00 |
| Solar brass generators | 1.00 |
| Roadster oval gasoline tanks | 3.00 |
| Asbestos brake band lining, 2x1/4", per ft. | .12 |
| Asbestos brake band lining, 2 1/2x1/4", per ft. | .15 |
| Asbestos brake band lining, 1 3/4x1/4", per ft. | .10 |
| 500 set Tire-saving Jacks...per set of 4 | 3.75 |
| Paint your Ford car complete outfit... | 5.00 |
| Metzger automatic windshields, brass, complete | 6.00 |
| Roadster divided seats...per pair | 25.00 |
| Timken, Hess-Bright, Two-in-One and Stand Roller Bearing, bearings in nearly all sizes | 1.50 |
| 500 Ford tool boxes, 22x9x6 | 2.00 |
| 400 tool boxes, enameled, 22x6x9...each | 1.50 |
| Jackson-Fuller honeycomb radiators, each | 10.00 |
| Ford Model T radiators | 18.00 |
| Buick Model 17 radiators | 21.00 |
| 4 cylinder air-cooled motors | 70.00 |
| 4 cylinder Mitchell motors | 100.00 |
| 1,000 sprockets, 48-tooth, 5/8" wide, 1" pitch chain | 1.00 |
| Starter gears for flywheels, 16"... | 2.00 |
| 5,000 Spitfire spark plugs, conical...each | .25 |
| 4,000 Spitfire platinum point spark plugs, list \$2.50, our price | .50 |

SEND FOR OUR No. 800 BULLETIN.

AUTO PARTS CO.

737-739 Jackson Blvd.,

CHICAGO, ILL.

PUBLIC SALE—WARREN AUTO CO.

These goods must be sold.

Send for our Bargain Sheet.

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|-------------------------------------|--------|
| \$ 1.00 Warranted Spark Plugs | \$.19 |
| 35.00 Gemmer Steering Gears | 12.19 |
| 150.00 Rear Axles | 42.00 |
| 350.00 Rear Axles and Transmissions | 98.19 |
| 14.00 Wheels all kinds | 3.00 |
| 75.00 Frames—all sizes | 10.00 |
| 18.00 Carburetors | 5.19 |
| 30.00 Windshields | 8.19 |
| 85.00 Magnetos | 25.00 |
| 65.00 Magnetos | 20.00 |

Lamps, bodies, tops and everything for the automobile at a price listed on list of our 1,000 bargains.

WARREN MOTOR CAR CO.,
51 Tenth St., Detroit.

RADIATORS.

Every radiator guaranteed absolutely new, not a reconstructed one.

In stock for immediate shipment.

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|---------------------------|---------|
| Ford Model "T" | \$18.00 |
| Buick 10-14 | 27.50 |
| Buick F-16-17-19-26-27-28 | 35.00 |
| Hudson 20 | 33.00 |
| Chalmers F-40 | 30.00 |
| Hupp 32 | 25.00 |
| E-M-F 30 | 30.00 |
| Anhut | 15.00 |
| Northern C | 32.00 |
| Wayne 30 | 35.00 |
| Special 40 H. P. | 15.00 |

5% discount allowed for cash with order, otherwise one-third cash with order, balance C. O. D.

We also have all repairs for the Wayne, Queen and Northern cars.

AUTOPARTS MANUFACTURING COMPANY

453 Trombly Avenue, Detroit, Mich.

RADIATOR COVERS

Full stock for all cars

Prompt shipment

Ford covers, \$1.40; other cars, \$2.50.
Allen S. Sinsheimer

1505 Michigan Ave., Chicago

RADIATORS—NEW GUARANTEED GOODS

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|------------------|------|
| Ford, Model T | \$16 |
| Buick, Model 10 | 22 |
| Buick, Model F | 25 |
| Chalmers-Detroit | 20 |
| Everett | 20 |
| Stoddard-Dayton | 25 |

Any other make required at equally low prices.

The Times Square Automobile Co.,

1210-1212 Michigan Ave., Chicago.

RIMS, RINGS AND RIM PARTS FOR ALL

rims made. Send for our rim part cata-

logue.

KASTNER TIRE AND RIM CO.,

2112 Michigan Ave.,

Chicago, Ill.

\$ SAVE YOUR DOLLARS \$

BY THE USE OF AMERICAN GASOLINE SAVER, YOU CAN SAVE 30% ON YOUR GAS BILL, increase the speed, start car easier. Guaranteed as represented. Price only \$5.00, special price to jobbers and dealers. Representatives wanted. Send for prices today. MONEY BACK IF YOU WANT IT.

AMERICAN RUBBER PRODUCTS CO.,
24 So. Clinton St., Chicago, Ill.

"SAVE YOUR GASOLINE."

We have 150 Rayfield carburetors, regular \$20.00 kind. Our price, \$8.20 while they last.

PURITAN MACHINE CO.,

415 Lafayette Blvd., Detroit, Mich.

SCHEBLER MODEL "L" CARBURETORS,
new, 1 1/2-inch, \$8.00 each. Order early.
Kent Motor Car Co., Kenosha, Wis.

SPECIFY A DIM-A-LIGHT ON YOUR NEW
car. Turning a switch reduces headlights
25%. Write us for information.

PELLETS MAGNETO EXCHANGE,

1463 Mich. Ave., Chicago, Ill.

SHINAUTO—THE GREAT PRESERVER.

Keeps auto like new without washing. Prevents cracking and checking of varnish. Makes old cars like new. Guaranteed. Saves paint bills. Trial can, 50c by mail. Enough for two months' treatment.

SHINAUTO MFG. CO., INC.,
1137-1139 No. Illinois St., Indianapolis, Ind.

SPECIAL BARGAINS

Rutenber motors, 4 cylinder model 27. 3 1/2x4 1/4, brand new with magneto attached; fan, starting crank, etc. Price, \$225.00. Fore door bodies, six and seven passenger. painted, ironed for top, untrimmed, \$25.00. Fore door bodies, ironed for top, untrimmed, \$20.00.

BEARINGS. No. 316 Hess Bright, R. I. V., New Departure and S. R. B., \$9.50 each. No. 219 D. W. F., 95 A-F & S, and 1219 S. K. F., \$8.50 each; No. 314 S. R. B., 15 B-R, I. V., \$7.50 each; No. 411 D. W. F., 9 C-R, I. V., 55 C-F & S, 411 S. R. B., 1411 New Departure, \$6.75 each. Other sizes also on hand.

Automobile Appliance Co.,
1712 Michigan Ave., Chicago, Illinois.

THAT MYSTERIOUS RAG

For dusting and polishing automobile bodies, windshields, lamps, pianos or any other polished surface. Will sell on sight, good proposition for garages. Sent to any address upon receipt of 50c.

THE GEM SUPPLY,
1036 So. Main St., Waterbury, Conn.

THE JONES & BUCKOKE—J. & B.

AUTOMATIC FUEL SAVER
Is indispensable for full power extraction. Never idle, operates in city and country. Three styles, all suitable for any car. Prices \$3.75, \$8.00, \$15.00. Write for folder. Germania Auto Repair, 1551 N. La Salle St., Chicago, Ill.

TOPS BUILT, RECOVERED AND RE-
paired. Also Top Covers, Radiator Covers, Luggage Cases, Celluloid, etc. C. G. Meyer & Son, Tiffin, Ohio.

TOPS, NEW OR RECOVERED; CUSHIONS
and Backs, new or recovered; Carpet Rugs; Curtains; Dust Covers, etc. W. H. Newton & Son, 120 Elm St., Cortland, N. Y.

TOURING, ROADSTER, RACING BODIES.
Seats, special and stock sizes. Radiators, hoods, tanks and fenders for any car. Get our prices.

Auto Sheet Metal Works,
1534 Michigan Ave., Chicago.

TRUCK BODY FOR SALE

A fine panel body, made for 1 1/2-ton Rapid truck, cost \$400 to build; no reasonable offer refused. Clover Farm Co., Worcester, Mass.

TRUFFAULT-HARTFORD SHOCK AB-
sorbers; \$45.00 kind; \$20.00 set of four.

PURITAN MACHINE CO.,

417 Lafayette Blvd., Detroit, Mich.

UNION OXY CARBIDE CO.

Manufacturers of Portable (weight 40 lbs.) and stationary welding, cutting or lighting plants; supplies of all kinds. Agents wanted. Fulton & Enfield Sts., Brooklyn, N. Y.

WELDING PLANT, CUTTING PLANT,
Carbon Removing Outfit, or a combination of all of these at from \$75.00 to \$175.00 for high or low pressure system. For full particulars address Bermo Welding Apparatus Co., Omaha, Neb.

WE MAKE FORD RACING TYPE BODIES
in several models for immediate delivery.

Auto Sheet Metal Works,

1532 Michigan Ave., Chicago, Ill.

WESTON MOTT HIGH GRADE REAR
axles, \$45.00. Other bargains, too.
PURITAN MACHINE CO.,
413 Lafayette Blvd., Detroit, Mich.

WE NOW HAVE BUT A FEW 30-35 AND
35-40 H. P. motors ready for shipment.
Complete with magneto, coil and clutch. F. E. Alford, Goshen, Ind.

\$50.00 AIR COMPRESSORS, \$18.00; FORD
lighting outfits, \$2.90; Coupe bodies, \$65.00;
Clamp on bumpers, \$2.95; Ford master vi-
brators, \$5.50, 6-80 storage batteries, \$9.50;
Electric horns, \$2.95. Fred Allen Auto Sup-
ply Co., 1610 Michigan Ave., Chicago, Ill.

WE TEAR 'EM UP AND SELL THE PIECES
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\$35 WINDSHIELD**

If you want to equip your car with a high grade, up-to-date Windshield, these money-saving bargains will interest you.

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See our fine lot of Auto tops made for Flanders "20" Touring cars; finest mohair upholstery and elegant finish; complete with fenders, side and storm curtains. Can be made to fit a Ford or Buick "10" Touring Cars. PRICE \$11.85

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Cycle Car Accessories

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PARTS FOR CYCLE CAR.

Light 14 h. p. opposed air-cooled motor with timer, coil, oiler and carburetor, shop-worn but in perfect condition, \$60.00. New planetary shaft drive transmission, \$18.00. Light shaft drive jack shaft and differential, \$15.00. Regal steering gear, \$7.00. E. E. Bush, 311 6th St., Parkersburg, W. Va.

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WANTED—TO BUY HUMMOBILE 32, 1913 or 1912 model; 4 or 6 passenger. State price and condition of car. Address Henry Uttermark, Weyauwega, Wis.

FIFTY CARS WANTED FOR CASH. Have customers waiting; if you want to sell your car quick, consign it to us; no charge whatever; we get our profits over your net figure; it is your privilege to remove car at any time without notice; will send for your car free within 200 miles.

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POSITION WANTED AS GARAGE MANAGER and assistant salesman. Desires position that will be permanent with good pay. Am at present employed in similar position. Best of references. For particulars address Box D 539, c/o Motor Age.

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Who has recently severed his connections with one of the largest Automobile Mfg. Branch Houses in New York, would like to connect with another Manufacturer in a similar capacity. Knows the trade thoroughly in New York, Long Island, Connecticut and New Jersey, as result of 13 years of experience, and can bring trade. Has been influential in the sale of many cars in territory mentioned. Any reliable house desiring services of such a man, address Box D 549, c/o Motor Age.

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And fitted with new pistons and rings.
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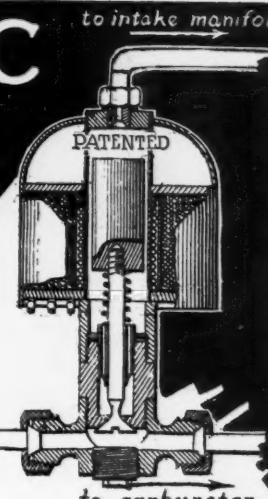
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As Necessary as Spark Plugs

One turn and off she goes. Hot, vaporized gasoline right into the intake manifold.

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When you're looking the car over, watch for that Detroit Spring trade mark.

It means safety. Detroit Springs are almost impossible to fracture.

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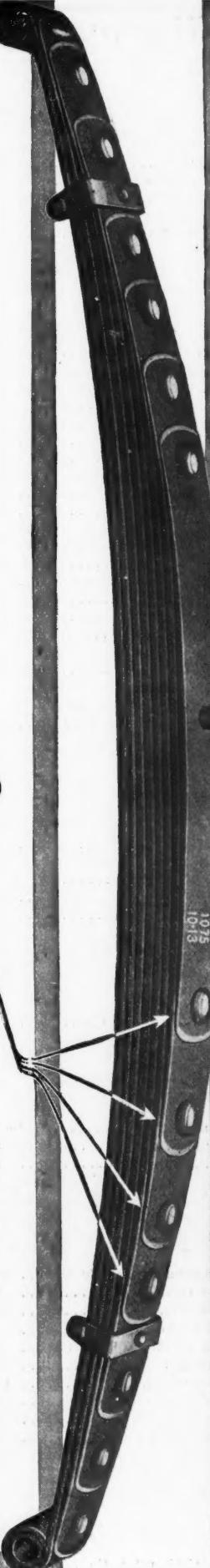
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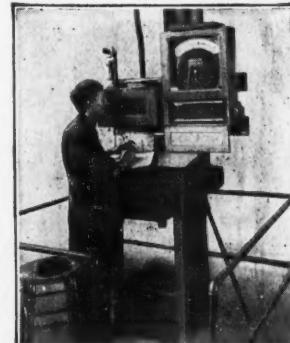
Why Detroit Springs Don't Squeak

The silence of Detroit Springs is enough in itself to decide you in their favor. The Self-Lubricating Device—patents pending—is simple, but mightily effective. Near the end of each leaf is a small distributing reservoir that automatically feeds the lubricant as it is needed. Not only is there no squeaking, but the spring is assured of far longer life. That's one of the reasons—

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Other reasons are material reasons, constructional reasons, workmanship reasons, test reasons.

We decided to make the guarantee of two years' length, because we wanted to be conservative. Detroit Springs will give excellent service indefinitely. Our confidence is shown by the fact that we have doubled and in many cases trebled the best car guarantee. And our confidence is based on the most enduring of foundations.



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Specify Detroit Springs on Your Next Car



The dealer who is successful in securing a Havers contract is pretty sure of a profitable business.

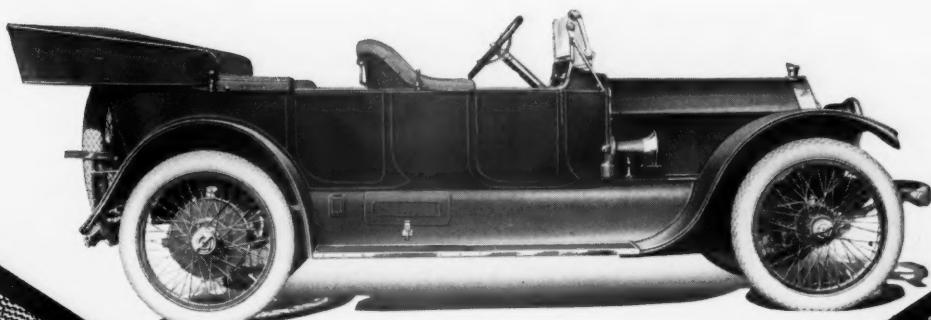
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It is the most remarkable value in the entire Six field.

We can use a few more thoroughly responsible dealers—and will be glad to send details of the Havers proposition to those who are interested.

Havers Motor Car Company
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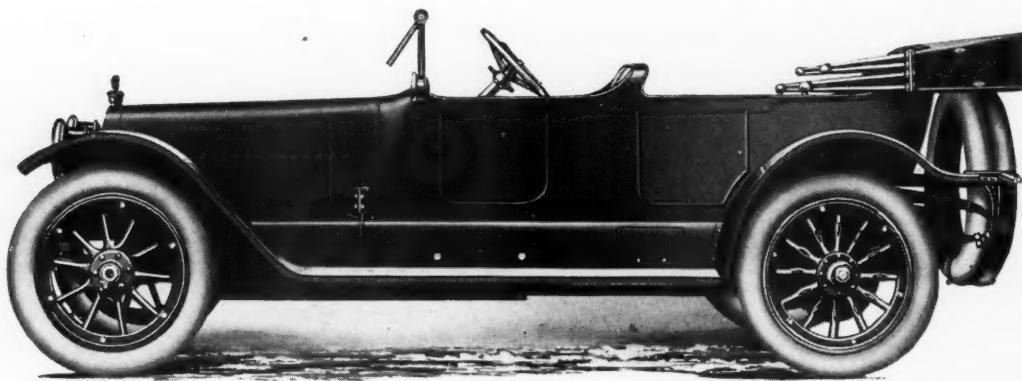


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Two New Stearns-Knight Models— Distinctive in Design and Construction



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FEATURES of body design never before seen in any American car distinguish the new Stearns-Knight four- and six-passenger touring cars. The upholstery and trimming are radically different from the ordinary type, without losing any of the comfort and luxury for which Stearns-Knight cars are famed. Smooth, dull leather, crossed by leather bands with buttons at intersections—the seats flanked by rounded arm rests—produce an unusual effect of roominess and comfort.

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